DECEMBER 1953

American Engineer

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IN THIS ISSUE . . .

• **BUSINESS LEADERSHIP—A POSITIVE RESPONSIBILITY**

By Leland I. Doan, President
The Dow Chemical Company

Engineer-Artist Remig A. P... as the servant of man's aspirations.

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Season's Greetings

. . . NEW LITERATURE . . .

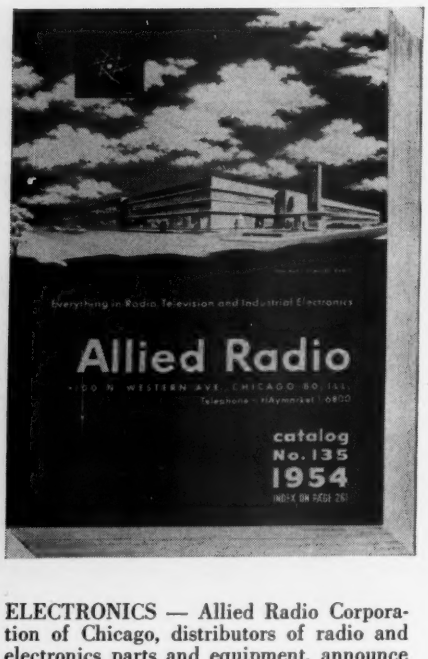
To help the offering firms determine which literature you require, when requesting an item, be sure to list all specifications shown . . . and say you saw it in the AMERICAN ENGINEER.

BANTAM BULLETIN—An unusual new product information bulletin was issued recently by the Schield Bantam Company of Waverly, Iowa, in the form of a four-page newspaper called the BANTAM CITY PRESS. The new bulletin features stories, pictures, and specifications concerning Schield Bantam's new 3/8 yard 5 ton Crawler Model C-35 as well as specifications and pictures of BANTAM's all-new, specially designed Crane Carrier built specifically for mounting of the new Model T-35 Truck-mounted BANTAM.

Latest factory production techniques, documented BANTAM owner reports, and unusual BANTAM machine applications are presented in interesting editorial style.

Copies of this new product information bulletin may be obtained by writing the Schield Bantam Company, Waverly, Iowa. Ask for the Schield Bantam bulletin titled "BANTAM CITY PRESS."

—AE—



ELECTRONICS — Allied Radio Corporation of Chicago, distributors of radio and electronics parts and equipment, announce the release of their 1954 general catalog. Reflecting the continuing growth of the industry, Allied's new catalog contains 268 pages listing over 20,000 items. According to J. W. Rubin, Sales Promotion Manager, this is the largest catalog in the company's history.

Special emphasis has been placed on equipment for industrial maintenance, research and production requirements. There are detailed listings of standard and special-purpose electronic tubes, test instruments, voltage stabilizers, transformers, resistors, capacitors, printed circuit components, the new transistors, rheostats, relays, switches, rectifiers, fuses, tools, wire, cable, photoelectric components, counters, program clocks, batteries, sockets, generators, power supplies and a wide variety of other electronic equipment and components.

This new 1954 buying guide may be obtained without charge upon request. Write to Allied Radio Corporation, 100 N. Western Ave., Chicago 80, Illinois.

STEEL ROLLING DOOR CATALOG—Illustrating the complete 1954 line of Cookson steel-rolling service doors, "Servire" fire doors, grilles, aluminum rolling counter doors and specialty doors, a new 12-page catalog is now available by writing to The Cookson Company, 1525 Cortland Avenue, San Francisco 10, California.

Primary feature of the catalog is said to be a series of charts designed to simplify selection of proper gauge and type of slats, guide type, power units and other components.

Cookson steel rolling doors are designed for use in warehouses, garages, factories, and other commercial and industrial applications.

—AE—

VIBRATION ISOLATION for a wide variety of equipment through properly engineered application of Armstrong's VIBRACORK is described in a new Bulletin, VC-501, available at no cost from the sole national distributors, The Korfund Company, Inc., 48-23R—32nd Place, Long Island City 1, New York.

VIBRACORK is a resilient board made of pure granules of cork, compressed and baked under pressure without any foreign binder at a temperature of 600° F. Deflection curves, physical properties, and methods of installation with typical drawings are included in the Bulletin. A partial list of 24 typical examples of equipment successfully isolated with VIBRACORK indicates the versatility of this economical, efficient isolating medium.

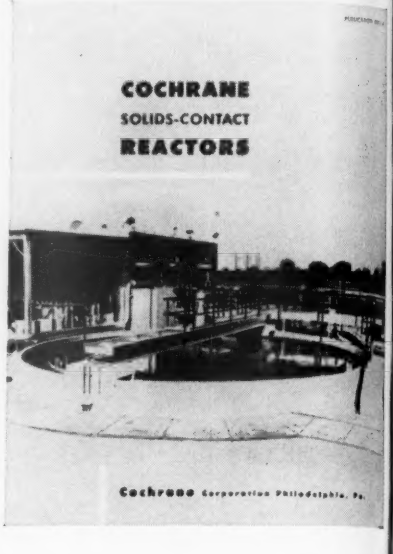
—AE—

WELDING BOOKLET—"The Case of The Ailing Weldollar" is the title of a new booklet available from The Lincoln Electric Company of Cleveland, Ohio. It presents an analysis of the basic causes of high costs and suggests a plan for reducing these costs. According to analysis, labor and overhead are responsible for 87.85 percent of the cost of welding. The cure for this high cost is high usable welding currents, faster welding speeds and less machine downtime. How these can be achieved is presented briefly and with clear graphic explanation in the pages of the booklet. A copy is available by writing to A. F. Davis, The Lincoln Electric Company, Cleveland 17, Ohio.

—AE—

KEY SWITCHES AND OTHER ELECTRICAL CONTROL COMPONENTS—Here is a complete, comprehensive catalog illustrating "telephone-type" components for industrial use. A helpful guide to engineers and purchasers.

Illustrated with scores of photographs and diagrams, it contains specifications and general data on key switches, impulsing devices, switchboard lamps, jacks and caps, and other control devices. Specification tables designed for easy ordering. Copies supplied on request to the manufacturer: Automatic Electric Company, 1033 W. Van Buren St., Chicago 7, Ill.



REACTORS BULLETIN — A comprehensive new 24-page Bulletin on its Solids Contact Reactor for clarifying and/or lime softening of water has just been published by the Cochrane Corporation, 17th St. below Allegheny Avenue, Philadelphia 32, Pa.

This catalog defines the major advantages of the Solids Contact principle, gives the eight basic requirements for sound Solids Contact Reactor design and shows how these features are incorporated by Cochrane. It illustrates the basic reactor types that can be supplied—round or square units with vertical shaft agitator, and rectangular units with horizontal shaft agitator. Reactors can be made of concrete, steel or wood or combinations of these materials. Chemical feed and auxiliary equipment also are described.

Copies of this Publication, #5001-A, are available.

—AE—

MINE SHAFT EQUIPMENT—A new bulletin which pictures and describes mine shaft equipment produced by the Mayo Tunnel & Mine Equipment Company is now off the press. Copies may be secured free of charge by writing to the Company at 560 South Prince Street, Lancaster, Penna. and requesting Bulletin #20.

—AE—

BOOKLET ON ALLOY STEEL SCREWS —"Improved Product Design with Mac-it Alloy Steel Screws," has just been published by Mac-it Screw Division, Strong, Carlisle & Hammond Company, 1392 West Third Street, Cleveland 13, Ohio.

This engineering folder has been prepared in the interest of better product design. Based on the theme that "better fastening produces better products," it is intended for use by design engineers, product development engineers, tool engineers, draftsmen and others concerned with the appearance and performance of industrial products.

Letters

Self-destruction? . . .

Dear Editor:

Attached is an amazing news item from the 9-17-53 edition of *Engineering News-Record* (p. 68). **(The item in question was headlined "Kansas Highway Department to Use Foreign Engineers" and dealt with the possible use by the Department of 100 qualified men from Mexico, a British engineer, and others.—*Editor.*)**

In lieu of a satisfactory salary the Kansas Highway Department is using the "wetbacks" of Mexico similar to the ranchers and farmers, etc., of the southwest states.

I have never before written a letter to any periodical or paper but this is absolutely incredible and makes me wonder if engineers have some strange compulsion to self destruction—both of economic and professional standing.

(Name withheld by request)

More On Baruch . . .

Dear Editor:

I was surprised and disappointed in the letter of Peter W. Rogan in the October AMERICAN ENGINEER on the subject of Bernard Baruch's article in the September issue. Not only does Mr. Rogan seem to have missed the point entirely, but most unfortunately of all, he has chosen to phrase his letter in the language of those who seek to destroy the separation of Church and State.

This separation was recognized by the framers of our Constitution as being basic to the creation of an atmosphere in which freedom could thrive.

History bears out that the greatest damage to mankind and human souls has been done by misguided moralists who used the word "sin" indiscriminately to brand all those who dared to think.

Let us not forget Mr. Baruch's last paragraph. "From time to time men arise who do promise Utopia—if only one will put oneself in their hands to be done with as they please. So speak the gold brick salesmen. So speak dictators."

We as engineers are interested in progress—subjective as well as objective. A return to clericalism is certainly no contribution to subjective progress.

NORMAN ROLFE, P.E.
Wilmington, Del.

"Errand Boy" Trend? . . .

Dear Editor:

Mr. Jenks' article on "What Kind of An Executive Does An Engineer Make" (AMERICAN ENGINEER, October, 1953) reflects the all too common attitude that engineering proper is a second class occupation and that an engineer, if only he were less of an engineer and more of this or more of that, should be a much more successful individual. I have taken exception to this attitude whenever confronted with it, and I earnestly deplore that the magazine supposedly fostering the aims of our profession should feature these views so prominently.

Mr. Jenks lists eleven essentials to the success of all businesses. An engineer may be able to affect items two through eleven, but he will do so in competition with any number of individuals who do not require any engineering skill or knowledge. Item 1, however, "a product or service in demand or potentially acceptable" may and in many cases does represent a challenge which only the devoted and competent engineer can meet.

Views similar to those expressed by Mr. Jenks are given wide publicity and unfortunately appear quite prevalent among those influencing the college graduate. They tend to discourage young people from following the true calling of the engineer. Interviewing fledgling engineers one notices the effect of such preaching again and again when apparently able and ambitious boys gladly will take jobs shuffling technical correspondence or act as errand boys for an executive but shy away from creative design work as from the blind alley it is so often depicted to be.

Many study engineering; a few of them at best will become good engineers; let them be encouraged to stay with the profession rather than to tell them *ad nauseam* that the manager's or the salesman's job is what they should aspire to. Otherwise we might come to the point that no perfection of organization, public relations or ballyhoo of salesmanship will sell the shoddy product, which lack of the engineer's skill made inferior.

F. C. TROMEL, P.E.,
Schenectady, N. Y.

Letter to a Grad . . .

Dear Editor:

May this letter have some value to all graduates. It is an American professor's advice to a graduate engineering student from India, upon starting employment with an American firm:

"Dear Andy:

The best encouragement and advice I can give you in starting your new job is what I have learned in starting mine: In the free association of men as employer and employee, both are on their honor to give their best. There is no compulsion; either can withdraw from the deal. The employee should give his best, not just what he thinks he is paid for, but his very best efforts, with perseverance, initiative, zeal, loyalty, forgiveness of his employer's short-comings. In this way he develops his talents and his character to their highest potential. His compensation may be inadequate, his recognition scanty, the working conditions poor. But if he gives less than his best, he cheats himself, stunts his own development. When a chance to better himself comes along he will be ready to take it, ready in his own development. By

(*To page* 49)

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American Engineer

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The destructive power inherent in matter must be controlled by the idealism of the spirit and the wisdom of the mind. They alone stand between us and a lifeless planet.

—John Foster Dulles, Secretary of State.

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Professional News in Capsule Form

L. L. Dresser Elected to New C-D Post • Tulane Establishes Engineering Research Institute • Tau Beta Pi Grants Four New Charters • Professional Development Program Is Under Way in Cincinnati • Other Items of Interest

L. L. Dresser, a past president of NSPE and director of the Tulsa, Okla., City-County Civil Defense Administration, has recently been elected a vice president of the United States Civil Defense Council. The election was held during a 3-day meeting of the council in Kansas City, Mo.; and Mr. Dresser, who is president of the Dresser Engineering Company of Tulsa, was also named to the executive committee for C-D Region 5 which includes Oklahoma, Texas, Louisiana, Arkansas, New Mexico, and the Canal Zone.

Long active in civil defense, Mr. Dresser was one of three Oklahomans who were official witnesses at the atomic tests in Nevada last March. His account of this event — "A Professional Engineer at Yucca Flats"—appeared in the May, 1953, issue of the American Engineer.

* * *

The formation of an Engineering Research Institute at Tulane University to serve the needs of the expanding industry in the New Orleans area has been announced by Dr. Rufus C. Harris, president of Tulane. Dr. Harris said the Institute would contract with industrial firms for specific research projects involving practical problems in numerous fields of engineering science. About twenty faculty members of the School of Engineering will take part in the work of the Institute, with physicists, chemists, and other specialists from various divisions of the university available as consultants on the projects.

Dr. Raymond V. Bailey, head of the Department of Chemical Engineering, has been named head of the Institute and will work under the general supervision of Dr. Lee H. Johnson, dean of the School of Engineering.

* * *

Tau Beta Pi, at its 48th national convention held recently at Clemson College, Clemson, S. C., granted charters to four new undergraduate chapters and took the first official step toward the admission of women to membership in the association. The four new chapters, to be installed later in the academic year, will be at Brown University, Providence, R. I.; the University of Denver, Denver, Colo.; the University of Rhode Island, Kingston, R. I.; and the University of Toledo, Toledo, O.

A special poll of 92 delegates at the convention showed that 68 planned on doing work for advanced degrees, 39 immediately following their graduation and 29 at a later date. Fifty of the 68 students indicated that they would go on for master's degrees, and 18 stated they would work for their doctorates.

Forty indicated that the research and development phase of industry held the most interest for them, while 23 specified design and 25 picked management as fields of major interest. Education, sales, and other engineering activities accounted for the remainder.

* * *

The problem of the so-called "post-college slump" that frequently hits young engineers is being tackled in a test program by the University of Cincinnati in conjunction with local industry and professional societies. The first step in the program is the advanced training now being offered by the University to young engineers and scientists employed in the Cincinnati area. There are 285 young men currently enrolled in the new courses which have been tailored to offer what industry thinks is "most needed" in the way of advanced study.

Cornelius Wandmacher, professor of civil engineering at the University of Cincinnati and one of the leaders of the plan, believes that the current program and the new courses may establish a basic pattern that will be followed and expanded upon in other areas to promote the professional development of young engineers who have just embarked upon their careers. Professor Wandmacher is also chairman of the Training Committee of the Engineers' Council for Professional Development.

* * *

Robert W. Van Houten, president of the Newark (N. J.) College of Engineering and a prominent New Jersey SPE member, was elected president of the Association of Urban Universities at a recent meeting of the organization held at the Sheraton Hotel in St. Louis, Mo. Mr. Van Houten the association's 37th president will serve for the 1953-54 term.

* * *

James F. Fairman, former Defense Electric Power Administrator and a past vice president of NSPE, has been named to the New York Board of Examiners of Professional Engineers and Land Surveyors. He takes the place recently vacated by Dr. D. B. Steinman, eminent bridge-builder and NSPE's first president, who served on the board for almost a quarter of a century.

* * *

Engineering students received the highest scores in the second series of Selective Service College Qualification Tests, according to a statistical analysis recently completed by the Eductional Testing Service, Princeton, N. J. More than 74,000 students, of whom about 52,000 were freshmen, took the tests on December 13, 1951, April 24, 1952, and May 22, 1952.

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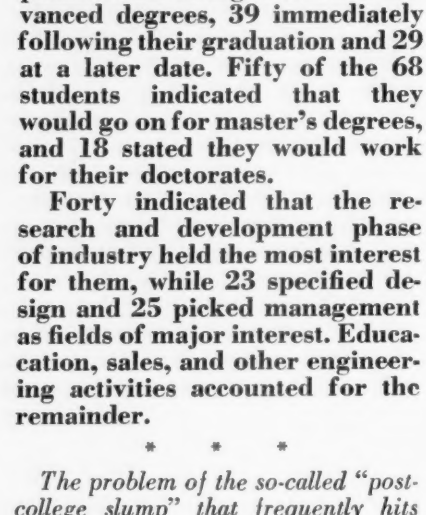

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Engineers

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the engineering students were those studying physical science and mathematics and then biological science students.

* * *

Kenneth E. Boulding, professor of Economics at the University of Michigan, warned against seeking better utilization of scientific manpower through governmental allocation measures or other steps which involve undesirable interference with the workings of the market economy in a speech before the National Manpower Council's recent conference on the Utilization of Scientific and Professional Manpower. "There is no such thing as manpower save as a hot abstraction to be handled with long tongs," Professor Boulding said; and he urged the participants to think of the utilization problem not in terms of "manpower," but of "men."

The meeting was held on Columbia University's Harriman Campus at Harriman, N. Y.

* * *

Phil Carroll, a member of the executive committee of the American Society of Mechanical Engineers and of the New Jersey SPE, has been awarded a citation by the faculty of the College of Engineering of the University of Michigan "in recognition of his outstanding achievements and of his contributions to the development of the field of Engineering." The award was presented as part of the celebration of the Centennial of Engineering at the University of which Mr. Carroll is a prominent alumnus.

Dr. M. J. Thompson, professor of civil engineering and associate director of the University of Texas Defense Research Laboratory, received a similar Michigan citation "for pioneering leadership in aeronautical engineering throughout the country and important research and textbook contributions in aerodynamics and fluid mechanics." Dr. Thompson is a member of the Travis Chapter, Texas SPE.

* * *

A three day conference on "Operations Research in Production and Inventory Control" is scheduled to be held at the Case Institute of Technology, Cleveland, O., January 20-22. The conference program, drawn up by Professor Clay H. Hollister, head of the Department of Engineering Administration, and Dr. C. West Churchman, director of the Operations Research Group, will be directed toward business and industrial leaders interested in the application of scientific techniques to problems in production and inventory control.

* * *

There should be more concentration on teen-age, high school level training in the sciences and mathematics, according to Dr. Frederick L. Fitzpatrick, head of the Department of Teaching Sciences of Columbia University's Teachers College. Speaking as chairman of a recent conference of industrial research directors and science educators, he expressed concern over reports of continuing shortages of scientific manpower and pointed out that: "To some extent this waste of manpower is related to economic causes, but more commonly it has its origins in poor school programs for attracting and preparing young people for careers in science."

Noting that enrollment in the nation's high schools is expected to increase at least 50 per cent in the next five years, he declared: "We must look to the secondary schools, where most students get their first serious look at science and mathematics. If they reject these subjects in their teen ages, the chances are that these boys and girls are either lost forever to careers in science or that they will have to be trained in basic science and mathematics by industry in on-the-job training programs."

* * *

Engineering graduates of New York University in 1953 started working at salaries that averaged 5 per cent more than in 1952. The average starting salary was $345 per month, with 71 per cent of the new engineers taking jobs in private industry. Dean Thorndike Saville of NYU's College of Engineering reported the figures, resulting from an employment survey of the June graduating class, and disclosed that 1953 beginning monthly salaries ranged from $270 to $412. The highest average starting salaries ($355) went to graduates in mechanical engineering and engineering physics.

The survey also showed that more students went into full-time graduate study in 1953—15 per cent as compared with 11 per cent in 1952 and the low of 3 per cent in 1951.

* * *

The Winter General Meeting of the American Institute of Electrical Engineers will be held in New York, January 18-22, 1954. The meeting is scheduled for the Hotel Statler, with overflow sessions in the Hotel McAlpin. The conference is under the general chairmanship of Charles T. Hatcher of the Consolidated Edison Company.

* * *

Dr. William Embry Wrather of Washington, D. C., director of the United States Geological Survey and a past president of the American Institute of Mining and Metallurgical Engineers, has been awarded the John Fritz Medal. The presentation of the award will take place in New York at a December dinner meeting of the four sponsoring societies — the A.I.M.M.E., the American Society of Civil Engineers, the American Society of Mechanical Engineers, and the AIEE.

(Continued on page 49)

O God, Look Kindly Upon this Group . . .

At a banquet held during the recent NSPE Board meeting in Indianapolis, the Reverand Raymond T. Bosler, Editor, the Indiana Catholic & Record, delivered the invocation. His words so impressed those attending, that they are repeated here in this our Christmas issue.

"O God, look kindly upon this group of engineers. They are men who plan and invent and make things go. Of all human beings their work seems to be most like Your own. And for that very reason they are in danger of neglecting You. They accomplish at times such wonders, they are apt to forget that all they do they accomplish only with guidance and inspiration from You the Engineer of the Universe. They can become so wrapped up in their figures and research, they fail to realize that the first and indispensable job of engineering they must master is that of saving their souls.

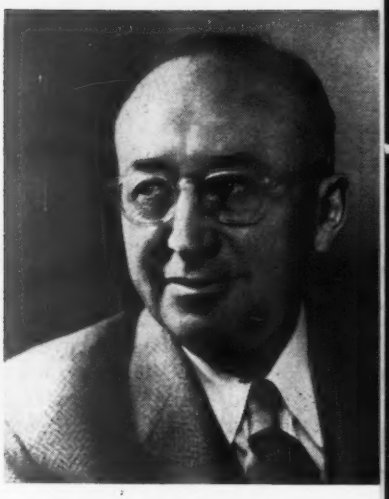
"They take this opportunity, therefore, to acknowledge their dependence upon You, to ask Your blessing upon their work, and to keep them ever conscious of the fact that they are the apprentices and You the Master Engineer."

About Our Cover . . .

We are pleased and honored to have as our Christmas cover this year, an original drawing by a member of NSPE's New Jersey SPE, Engineer Remig A. Papp. About this excellent work, Artist-Engineer Papp, says . . .

"Every time when in New York I pass in front of the Atlas statue by Lee Lawrie I think that this statue should become the symbol of the United States. The modern giant has to carry the burden of the whole world, and in his task a paramount portion falls to the American engineer. The ability and devotion of America's engineers makes it possible for millions of families throughout the free world to celebrate the Holy Night beneath a Christmas tree, and enjoy themselves on this beautiful holiday of peace, faith and family."

Some of the 1,200 stockholders who attended Dow's 56th annual Stockholders Meeting in August, 1953, at the company's headquarters in Midland, Michigan.



Dr. Leland I. Doan

Business Leadership—a Positive Responsibility

By

DR. LELAND I. DOAN,

President, The Dow Chemical Co.,

Midland, Michigan

THE complexion of American industry has changed vastly since its early days. We have learned—and learned the hard way—that private enterprise is not really private at all. Rather, in our democratic society business must rise or fall in the degree to which it serves the public and the public interest.

Industry is the pump that draws up the resources of nature and converts and conveys them to the benefit of humanity. No one is more aware of this than the engineer whose personal responsibility it is to effect this conversion and whose consequent obligations in the broader realm of social relations increase proportionately day by day. No longer can he afford to be a "technological introvert," as no longer can anyone else in the business world afford to confine his interests exclusively to the narrow niche in which his particular job is classified.

Every man in every industry, no matter what his rank, does his share in creating a position of leadership for that industry. And business leadership today is something to be considered in terms of responsibility, not of power.

Rightly or wrongly, business was blamed for the tragedy of the great depression of the thirties; and, while we recovered our economic health in less than ten years, it took nearly twice as long to regain the respect and confidence of the American people. Right now, in the public mind we "have the ball," but we are also only on probation. Therefore, if we are to have our greater era of production and prosperity, we of business and industry—executives, administrators, scientists, engineers, and workers of all classifications—must maintain a high degree of public consciousness as the underlying foundation upon which our decisions and operations are superimposed.

The most visible thing about today's American public is that, despite the burden of supporting a preponderant military and governmental burden, it is, by and large, enjoying an unprecedented level of prosperity. It is a public with money in its pocket, willing to spend it. It is eager to take advantage of the better and better material things it has learned to expect of engineering, science, and industry.

Europeans, I understand, are frequently inclined to be mystified by our acceptance of obsolescence. They consider it wasteful, while those of us who do the research and turn the wheels back of American industry accept obsolescence as a natural symptom of progress. So long as the new is better, we are discontented with the old. And the American public is of a similar frame of mind. The people here do not resist change; they are eager for it. Given the spendable income, they are quick to grasp the power lawn mower and the television set without shedding tears over the hand machine or the neglected radio.

This public is progress minded. And in that we are

fortunate, for it gives us, at our doors, the world's best customer. Progress is the very essence of prosperity; stagnation is the beginning of decay. So, being our eager customer, the public is the staunch ally of industry's engineers and scientists as they open new fields and introduce new products as we continue to advance under the free enterprise system.

We must not, however, think of this present day American public only as a customer in a fever to spend his income for every new gadget we may be able to dream up. The idea that Americans are best typified by the word *materialistic* is, I believe, a most unfortunate one.

QUITE to the contrary, the American public today constitutes an amazingly well-rounded personality. By all standards it is an extremely well-educated public. Not only have we reached unprecedented levels in the spread of formal and specialized education, but our development of mass communication has vastly broadened the general knowledge and the awareness of the average citizen. As a consequence we have a public that is better informed, less given to prejudice, more concerned with social, political, and economic problems, and better equipped to have a worthwhile opinion concerning them.

Furthermore, this public has matured considerably from a cultural standpoint in recent years. It is an axiom of our society that we have a sort of benign circle in which the monetary fruits of material advance pave the way for cultural progress that might otherwise remain latent. And, reciprocally, as we progress on the cultural side we increase both our desire and our potential for a broad dispersion of material welfare.

Of course, on the other hand, there is the fact that years of depression, plus more years of war, plus the international uncertainty which still confronts us have left little room for gullibility or faith in an inevitable happy ending in the public mind. On the contrary, the public has, if anything, developed a "show me" attitude. We have perhaps fallen heir to a sort of national cynicism which fits us uncomfortably like an outsize garment. It is not of our nature. Yet, nevertheless, the two decades of economic and military uncertainty have left this mark.

I do not believe the American public has any real *desire* to be cynical. But neither does it wish to be a sucker. And rightly or wrongly, it has too often in recent years felt itself a scapegoat. Cynicism is but a logical defense against still further encroachment.

The public recognizes, I am sure, that our progress as a nation has not sprung from a philosophy of mediocrity; that our scientific and industrial advance has not been brought about by men striving to be common, but rather by men striving to distinguish themselves. For our American definition of distinction has been based upon performance rather than birth. The man of humblest birth has not only been *free* to distinguish himself; we have made it worth his while.

Here again, however, the emphasis on achievement is defined in some singular and spectacular way. But we must also keep in mind — and keep the public aware through our best public relations efforts—that industrial progress as such is essentially a moderately-paced process that has long-range rather than momentary implications.

If a man is building a house for his family, for instance, he has started it only after determining to his own satisfaction that it is the proper and desirable thing for him to do from the standpoint of his outlook and financial condition. Then, once started, he does not change his program unless there is some drastic change in one of these conditions.

Saran-Wrap, Dow's first consumer product, is used for wrapping various foods to protect their original freshness.

HE does not, for example, suspend the project or reduce the plan from eight rooms to six rooms because his pay check is light for a couple of pay days as a result of temporary illness or a reduced work schedule. If, however, he loses his job or becomes entirely unemployable as the result of some serious illness or accident, that changes his outlook entirely, and he may well have to modify his plans to fit his new circumstances.

But basically he goes ahead with whatever he has determined is reasonable when viewed in relation to his long range expectancies. He knows in advance that there will be some short term ups and downs, but he also knows that in the long pull they will tend to even up. And if he is doing a good job and taking maximum advantage of his opportunities, he can be reasonably sure that his condition will gradually better itself.

The same principle holds true for industrial growth and development; except here it is immensely multiplied and complicated. Thus, as the householder, we are building for the future, working to provide a base for tomorrow's opportunities. Our current research expenditures, which are vital and essential, can be tied only rather loosely to today's income because we are presently living on the research of ten or twenty years ago and expect to be enjoying the fruits of today's research ten years hence.

This is also true of construction on only a slightly shorter term basis. The engineering of new plants requires many months, and their actual construction many more months. The whole industrial process, from the inception of an idea to the beginning of production may take two to five years.

At Dow, for instance, we know that a plant which we expect to see in production three or four years from now is not going to operate in a vacuum. So we have to study it in relation to our other operations and determine what effect it will have on them. Presumably it will require power to operate it. Are we going to have enough? If not, then we must plan now to have enough power by that time. In other words, we must start work on a power expansion program. And what is the new plant going to need in the way of raw materials—fuel, brine, bromine, chlorine, gas, ethylene? We will have to plan so as to have

greater production of the necessary raw materials—and, of course, the power for *that* greater production, too.

So each new project sets off a sort of chain reaction affecting many other operations from power generation and raw material supply to shipping facilities and waste disposal. All these factors must be taken into consideration and coordinated into a highly complex program necessary to insure that somewhere along the line our operations do not get out of balance. Additions to, or subtractions from this program, therefore, do not stand alone, but alter the whole program. That is another reason why, once an industrial course is set, we almost of necessity must move steadily forward on it.

AND that, of course, is one of the important things that we want the public to understand as it waits to be "shown" what business and industry can do. In order, then, to achieve this public understanding—to create and maintain a public interest in and appreciation for our efforts—we must, I believe, foster certain values beyond mere standards of technological excellence.

First of all, we must make and keep a resolution to look forward, not backward. And if we believe in looking forward, we must also staunchly believe in a high level of employment, in good wages, in more and better products, and in greater and greater efficiency in our productive effort.

We must believe in equitable distribution of the proceeds of our operations. And *equitable* does not mean building up the few at the expense of the many. To be sure, it means a fair share to the owners, the investors in a business. But it also means better value to the customer and better value to the worker according to the increased effectiveness of his work. High productivity and the prosperity which it implies do not result from great purchasing power in the hands of a few, but from the over-all purchasing power in the hands of the vast American public.

Secondly, if we are truly forward looking, if we believe these things, then we must have the courage of our convictions. We must be optimistic, not pessimistic. We must be courageous, not jittery.

Thirdly, we must resolve to express ourselves in terms of our convictions. We must not be afraid to stand up and be counted, since true leadership means forging carefully but confidently ahead, not dragging our feet and mumbling, "Watch out! Be careful! Take it easy!"

We must have, and believe in, positive attitudes toward labor relations, toward competition and customer service. We should, by all means, take a positive attitude toward research and product development, for the things that will supply many of tomorrow's wants, many of tomorrow's jobs, and much of tomorrow's prosperity have yet to emerge from inventive minds.

And we ought to take a positive approach to political problems, whether they be local or national. We need a positive attitude on such things as education and social problems because if we are truly interested in the public which we serve, and to which we are ultimately responsible, then the public will be interested in us.

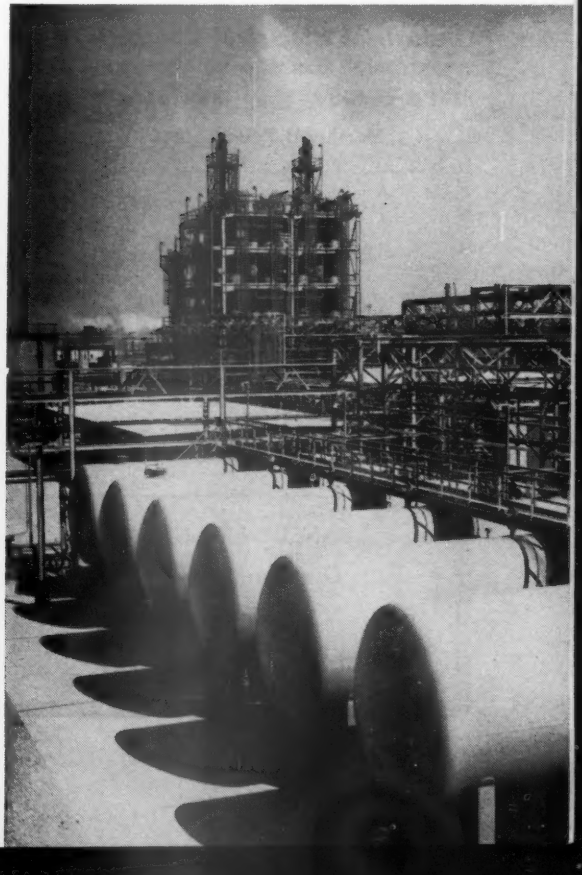
We need courage, faith, and optimism. For the freedom and incentive to take the calculated risk are of little value if we lack the courage to take it. After that we need to practice the enlightenment, the morality, the humanity of which we boast with the conviction that they have been lessons in truth, not recitations of enforced ritual.

We need to emphasize creativeness as the primary goal of our competitive enterprise. We can profit on a limited scale if we succeed in getting a larger share of an existing market. But when we create a better product, or a *new* product, when we grow from *within* through the efforts and determination of our engineers and scientists, we bring new wealth into the world.

Finally, if we do all these things in a spirit of public consciousness with an awareness of our responsibility, we will assuredly receive in return the public confidence which is an indispensable element in the progress of any enterprise in America today.—***End.***

(A biographical sketch of Mr. Doan appears on page 49.)

Below: Scene in a section of the new $2,600,000 W. R. Veazey Research Center at The Dow Chemical Company's Texas Division, Freeport. Right: This is the glycol plant at Dow's Texas Division.



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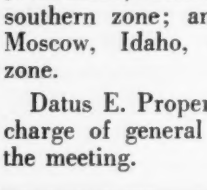
Stanley G. Palmer Installed as N.C.S.B.E.E. Prexy at San Antonio

Stanley G. Palmer, dean of engineering at the University of Nevada and a prominent NSPE member, was installed as president of the National Council of State Boards of Engineering Examiners during the group's thirty-second Annual Meeting, held recently at The Plaza Hotel in San Antonio, Texas.

During the meeting the reports of various committees were considered at length, and among the highlights were the discussions of the administration of registration laws and of the possibility of establishing uniform examinations for E.I.T.'s. A special social program was also provided, and members of the Texas SPE were guests at a number of the events.

In addition to Dean Palmer, other new officers are: J. W. Gore, Baltimore, Md., vice-president; A. L. Jones, West Orange, N. J., director, northeast zone; and E. D. Dake, Rapid City, S. D., director, central zone. Mr. Jones is also a past president of the New Jersey SPE. In addition, three other officers remain on the slate from the past year: A. G. Stanford, Atlanta, Ga., past president; J. H. Sams, Clemson, S. C., director, southern zone; and A. S. Janssen, Moscow, Idaho, director, western zone.

Datus E. Proper was chairman in charge of general arrangements for the meeting.



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Architectural League Gold Medal Competition Open to Engineers

The Architectural League of New York has announced the 1954 National Gold Medal Exhibition. This will be the fifty-seventh annual exhibition to honor outstanding work in architecture and allied fields, including engineering, by awarding gold and silver medals and honorable mentions.

Work in engineering, to be eligible for an award, must involve some visual aspect of building — either structural, mechanical or electrical— and be characterized as a special or unusual contribution in design to the progressive development of structures. The Engineering Committee on Selection consists of: Peter A. Strobel, chairman, Henry F. Richardson, Gilmore D. Clarke, Fred N. Severud, and L. Andrew Reinhard.

Preliminary submissions, consisting of photographs only, are open to December 31, 1953. A circular of information may be obtained from Peter A. Strobel, 70 West 40th St., New York 18, N. Y.

Robbins To Address Land Surveyors

Paul H. Robbins, NSPE executive director, will be the principal speaker at the Fourteenth Annual Land Surveyors Conference and Exhibition, which is scheduled for Saturday, January 23, 1954, at the Rutgers University Commons, New Brunswick, N. J. The subject of his address, which will be delivered at the opening session of the conference, will be *The Surveyors' Status in the Society.*

The meeting, which is expected to attract many engineers and land surveyors from throughout New Jersey and many nearby States, is sponsored by the Land Surveyors Division of the New Jersey Society of Professional Engineers. Special greetings from the National Society will be presented in another address by V. Pres. Clarence T. Shoch of Allentown, Pa.

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20TH CENTURY INDUSTRIAL FRONTIER

By

ALBERTO HERNANDEZ, P. E.,

President, Puerto Rico SPE

Member, NSPE

• *An American Engineer Photo Story* •

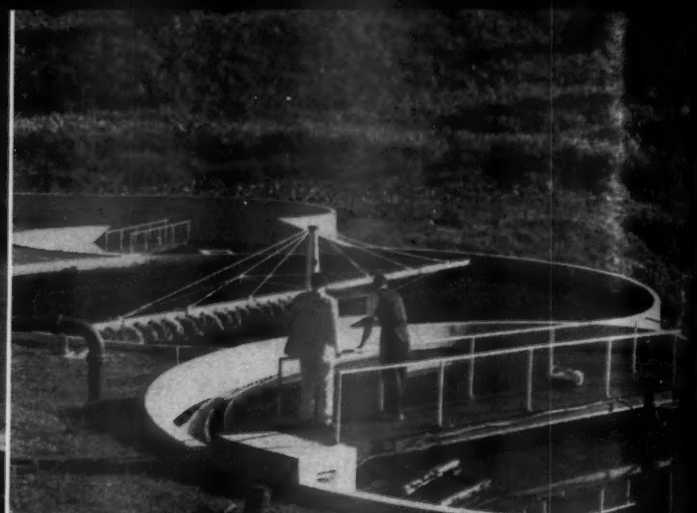
A few short years ago, practically the only word in the economic lexicon of Puerto Rico was *agriculture*, and the only really important product of that agriculture was sugar.

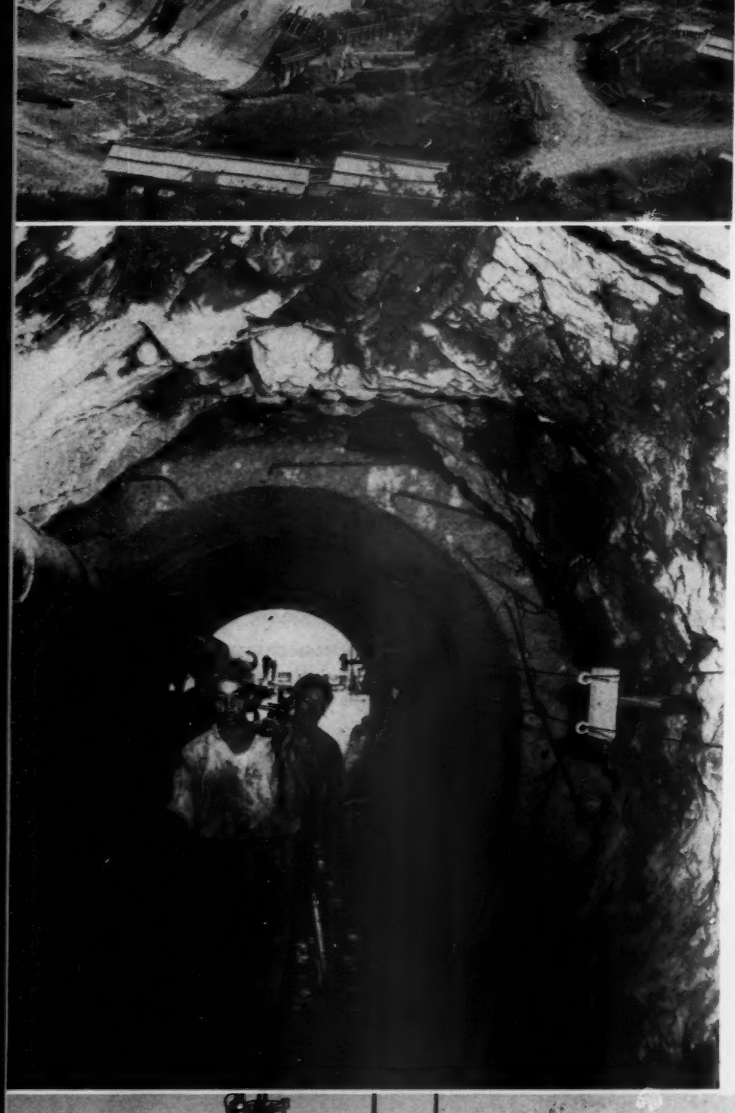
Today, while sugar is still a very important and indeed a vital element in our economy, twentieth century industrialization is at last also taking a firm and substantial hold on our island. Such names as Sylvania Electric, Textron, Univis Optical Corporation, U. S. Rubber Company, Remington Rand, and the St. Regis Paper and Bag Corporation are becoming as familiar in everyday conversation as the musical old Spanish names of our towns and cities.

In short, we believe we have here in Puerto Rico a new frontier for United States industry—and, incidentally, a new proving ground for engineering careers—strategically located with easy access to both North America and to the raw materials and expanding markets of South America. We also have an ample labor force to meet the requirements of the major manufacturers coming to the island. And the Commonwealth Government has backed up its invitation to new industries with a generous ten-year tax exemption program.

The objective of this industrialization campaign is the creation of 800 new industries that will employ at least 80,000 workers. More than 250 new plants have already been established and are directly or indirectly providing employment for about 35,000 workers. We are producing for local consumption and for export Portland cement, paper, ceramics, glass containers, leather goods, rugs, textiles, shoes, jewelry, clay products, machinery, electrical equipment, cigars, plastics, and many other

Shown on the left is the late Antonio Lucchetti, former Executive Director of the Puerto Rico Water Resources Authority and Carl A. Bock, now Executive Secretary, as they studied plans for the expansion of hydroelectric services.



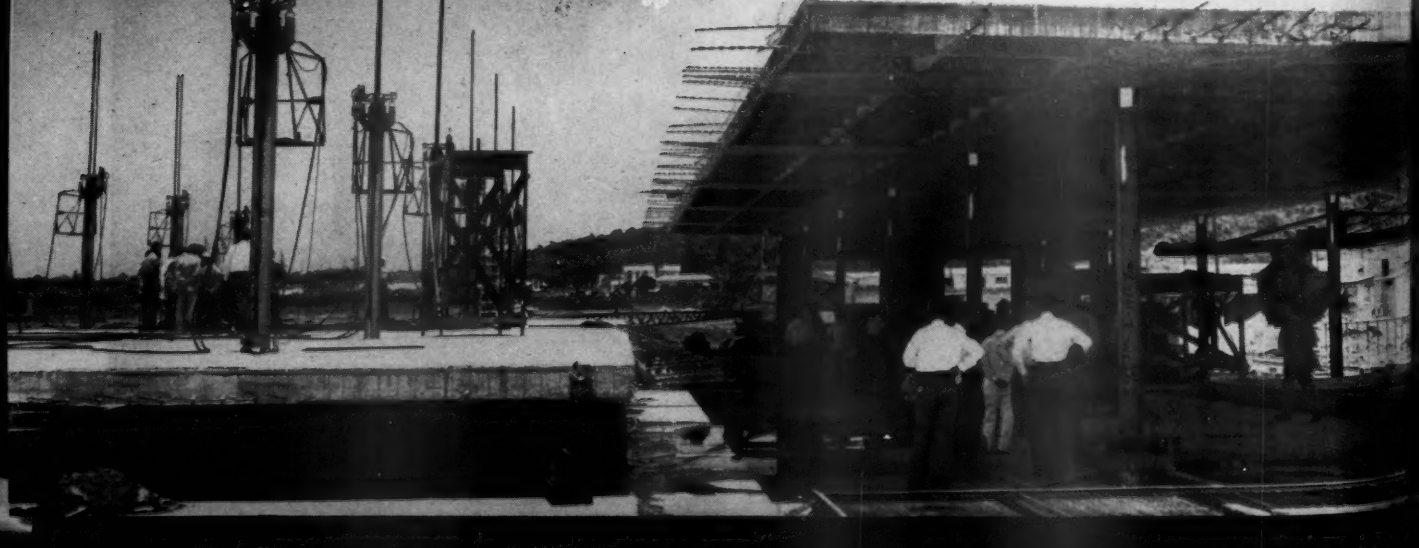


products. Professional engineers are playing prominent parts in every phase of the development of these new enterprises—with both the private concerns that are establishing themselves in the island and the governmental agencies that are actively sponsoring the improvements that will provide an even more inviting climate for industry in the country.

The smallest island of the Greater Antilles, Puerto Rico comprises an area of approximately 3,425 square miles, including the nearby islands of Vieques, Culebras, and Mona. The 1950 population figure was 2,206,414 inhabitants, and it is expected that it will reach the 3-million mark within a few decades; so the need for a program of economic development that will provide support and suitable living conditions for the people of the island has been urgent for some time.

Discovered by Columbus during his second voyage in 1493, the island was first settled by Juan Ponce de Leon some fifteen years later, and it remained under Spanish rule until the 1898 Treaty of Paris transferred it to the United States. Puerto Ricans have been recognized as citizens of the United States since 1917, and the position of our Government—an autonomous commonwealth under the United States flag—is unique in the political world. Since 1947 we have had the right to elect our own governor, the office being held currently by the Hon. Luis Munoz Marin, an outstanding leader in the drive for economic and social progress.

One of the most important governmental agencies en-



◆ Shown on the opposite page, counter clockwise: A new sewage treatment plant at Lares; The new Loiza Dam that will help supply San Juan with water; Puerto Rico is bringing water from her mountain tops through 10 miles of tunnels, to irrigate 25,000 acres; Engineers continue experiments in new types of industrial buildings such as this "lift-slab" method of roof construction.

gaged in the present campaign to transform the island to a new Mecca for private industrial concerns is the Puerto Rico Planning Board which was created by our legislature in 1942. Since its inauguration its chairman has been Dr. Rafael Pico, who for two years was the president of the American Society of Planning Officials, and with him work numerous engineers, architects, and other experts. The accomplishments of the Planning Board are internationally known, and some of its regulations have served as models in Latin American countries and the Philippines.

Another such agency is the Economic Development Administration under whose auspices 105 industrial buildings have already been constructed, while 20 more are currently under way. These facilities are made available for lease or sale to private concerns under the industrialization program. Thus, to initiate the program, the government originally installed and operated five plants for the manufacture of Portland cement, glass containers, cardboard, ceramics, and shoes. Then three years ago the first four were sold to Ferre Enterprises, a private corporation that owned another Portland cement plant and a large machine shop and foundry in the southern part of the island, in line with the governmental policy to transfer any government-sponsored industries to private ownership as soon as possible.

Of course, to attract new enterprises, to interest the industrial investor and his top technical personnel, the services essential to industry—dependable electric power, transportation facilities, and so on—must be developed and maintained at a consistently high level. This has been one of the biggest tasks undertaken by the professional engineers working for or with the Puerto Rican government, and we are quite proud of what has already been accomplished to turn our island into a new frontier for industry.

For instance, there is the Puerto Rico Water Resources Authority, that was created by law in May, 1941, but which really has its roots in a 1908 law authorizing the construction of a Public Irrigation System for the benefit of the southern coastal plains. When the original project was completed in 1915, it was evident that the production of hydroelectric power, incidental to irrigation purposes, would soon become a major factor in any further plans. The demand for electric power increased so rapidly that the Government was soon embarked on an ambitious program of hydroelectric development.

Puerto Rican and American engineers have worked hand in hand in developing an efficient electric power system for the island. Among the latest projects are the construction of a modern steam electric plant near San Juan, with an initial installation of four 20,000 KVA units, and the Lajas Valley project—a multiple purpose hydraulic development.

The purpose of the latter is to completely develop the water resources of the Yahuecas, Guayo, Prieto, Toro, Yauco, Duey and Loco rivers for the production of some 100,000,000 KW-Hr. of electric energy every year, the irrigation of about 26,000 acres of land in the Lajas Valley, the provision of 6.5 million gallons of water per day for water supply of nearby cities, and also flood control.

The plan contemplates the collection, for its proper use, of the run-off water from 70 sq. miles of drainage area from the above-mentioned rivers by means of reservoirs and waterways and includes the following:

1. Construction of seven dams ranging in height from 60 to 200 ft. The Guayo and the Yauco Dams with a little more than 100,000 yds. of concrete are the largest.
2. The driving of about 65,000 ft. of tunnel.
3. Construction of two power-generating plants.
4. Development or irrigation and drainage systems for 26,000 acres of land.

The estimated cost of the project is $32,000,000, 26 millions of which will go to the hydroelectric phase and the remaining 6 millions to the irrigation phase. It is unquestionably one of the most elaborate single projects conceived and started by the present Government as part of the program designed to elevate Puerto Rico's economy and progress.

The extension of electric distribution lines into the rural areas has also been a matter of policy of the Government of Puerto Rico for many years. The current program, developed under 1946 legislation, has been highly beneficial to rural zones which otherwise would not now be enjoying the advantages of electric service. By the end of 1952, approximately 550 km. of primary lines and 450 km. of secondary lines were constructed adding about 9,800 new customers to the system; and the Legislative Assembly, in its last regular session, voted a $300,000 appropriation for the present fiscal year.

In view of the fact that the supply of potable water and the disposal of sewage are indispensable services in a progressive and growing community, the Puerto Rican Legislature created the Puerto Rico Aqueduct and Sewer Authority in 1945. To this Authority the Government of Puerto Rico gave all the tools to provide an adequate supply of potable water to and means for treating and disposing the sewage for all the communities, urban and rural, in Puerto Rico. This agency has done a very creditable work in a comparatively short time, and before many more

The $2,300,000 Constitution Bridge, under construction, is scheduled for completion in 1954. It is a direct artery to both main avenues leading into downtown San Juan, the dock area and the airport.

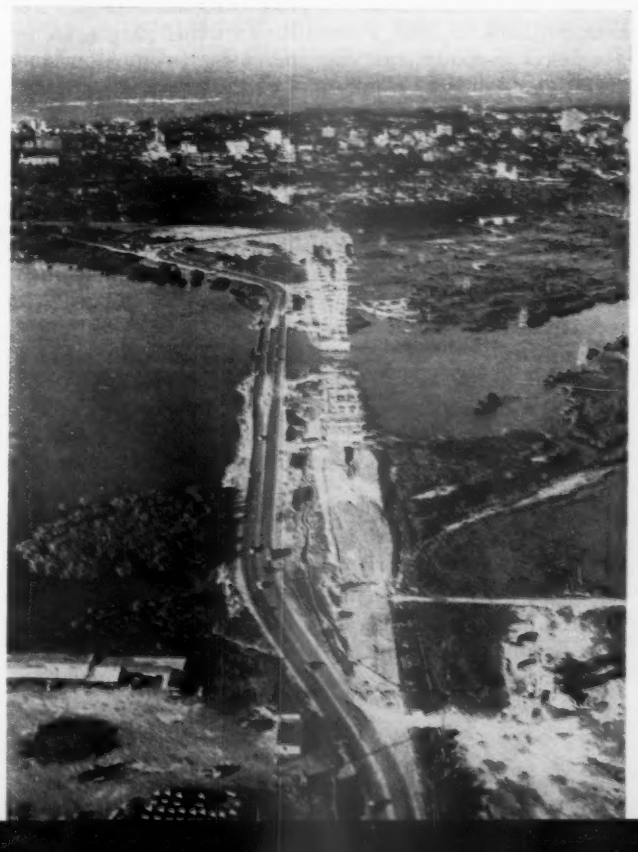


Photo shows a slum area in San Juan before it was cleared and a modern housing project built in its place.
See photo on opposite page.

months have passed, the Commonwealth of Puerto Rico will have completed and put into service its major water supply system—the Rio Grande de Loiza project. This project, which has been under construction since 1941, was started by the Government of the Capital of Puerto Rico with PWA funds and is being completed by the Puerto Rico Aqueduct and Sewer Authority. The eight-million-dollar impounding reservoir and filtration plant will add thirty million gallons of filtered and sterilized water to the San Juan metropolitan area daily and insures a completely adequate water supply system for the next fifty years. Nowhere else in the Caribbean is there a comparable water system as to size and adequacy. Completion of the San Juan system is the first step in an island-wide program that will involve total costs of $40,000,000 and will require many years of concentrated development and construction.

BESIDES this major and ambitious project, eight new filtration plants were added to the Puerto Rico System before June, 1953; and many thousands of feet of pipe lines have been installed to carry water to suburban and rural communities to meet the demand of an increasing population and of new industries.

Since the industrialization program gained greater momentum back in 1948, Puerto Rico's roads have been under heavy pressure, carrying increasing production loads from new plants in all corners of the island to shipping points in San Juan. Less than ten years ago there were only 28,000 vehicles of all types registered here. Today there are 86,000, including one automobile for every twenty-five persons.

In order to meet present traffic conditions, therefore, Puerto Rico's network of well-traveled major highways is being given a thorough overhauling, and new roads are being constructed at a fast rate to keep pace with industrial progress.

Presently some $17,000,000 is going into the building of new highways and bridges and the resurfacing of older arteries webbing the entire 100-mile long, 36-mile wide island; and the Government continues to allocate heavy sums from each budget for transportation and communications facilities.

Major cross-island construction and improvement is centered on the 78-mile highway linking San Juan with Ponce. A new $6,000,000 four-lane superhighway connecting Rio Piedras, a San Juan suburb, with Caguas in the tobacco belt 16 miles away is already in use and will be fully completed early in 1954. Sylvania Electric Co., Inc., Pan American Plastics, and the Consolidated Cigar Company are three of the major concerns located along this route.

Along the northeastern shore, a six-and-one-half-mile stretch of new, four-lane road to Carolina, opened in early 1953, has brought at least 12 plants to the now bustling industrial center which little more than five years ago depended entirely upon its sugar production. New construction is under way along the rest of the drive to the tourist attractions of Luquillo Beach and El Yunque Tropical Rain Forest.

GOING west from San Juan, the modern Military Highway, an 80-mile section of road that rims the perimeter of the island from the capital city to Ponce, has made beehive communities of Bayamon, Toa Alta, Vega Alta, Vega Baja, Manati and Arecibo. Remington Rand's Puerto Rico Precision Tool Company, the U. S. Rubber Company, the Maremont Manufacturing Corporation, Caribe China Corporation, and scores of others have settled down to profitable business with this major artery at their doorsteps so that they are just a short trucking distance from San Juan's docks and airport.

On the southern coast, Highways 1 and 2, connecting at Ponce, have been completely resurfaced with Plant-Mix asphalt top from Salinas to Yauco, a distance of nearly 40 miles. Ponce, the island's second largest city, is now the site of 17 new plants, including those of the Textron Co., St. Regis Paper and Bag Corporation, Ford Gum & Machine Co., and National Packing Co. Previously the drive from Ponce to San Juan through Salinas, Cayey, and Caguas took more than four hours over the interior mountain ranges. Today it can be made in less than three hours and many stateside manufacturers are taking advantage of good industrial sites and excellent labor supply available outside of the crowded metropolitan San Juan area now that road transportation is no longer a problem.

In San Juan, heavy traffic merging from all over the island off major Highways 1, 2, and 3 is being eased considerably by the construction of the Martin Pena and Constitution Bridges linking the outskirts with two main avenues into the downtown area.

Besides our expanding road system, the island is being provided with adequate facilities for air and maritime transportation to meet the demand of the new industries, tourist visits, and the increasing travel to the mainland. Improvements are being made to our present airports and new ones are being built and planned.

Among the most important projects sponsored by the Transportation Authority is the new International Airport, that can well be termed America's airport of the

The modern low-rent housing project built where the slum shown on the opposite page was located.

future as it meets all the safety requirements recommended by the Doolittle Committee. It is located at Isla Verde, only a fifteen minute ride from the heart of San Juan.

Construction work started two years ago, from designs drafted more than twelve months earlier. The finished airport will have a concrete runway 7800 feet long by 150 feet wide with a parallel 75-foot wide taxiway matching the runway in length, making takeoffs and landings to and from the sea possible at either end. The consistent east to west direction of the trade winds that sweep Puerto Rico the year round fits perfectly with the needs of the new air terminal; and the absence of fog and the lack of any low-visibility problem are other unique advantages.

Salvador V. Caro, a professional engineer, general manager of the Puerto Rico Transportation Authority which operates the island's airports, emphasizes the fact that construction on lands adjacent to the airport runways will be limited according to the recognized and established safety standards.

THE Terminal Building will consist of a six-story main lobby with a two-story outbound wing and a one-story inbound wing. Besides the usual facilities for processing passengers, it will also have a restaurant, concession areas, rooms for aviation companies' officials and adequate space for Civil Aeronautics Administration and Weather Bureau offices. Other facilities will include a Cargo Terminal Building, Fire and Police Stations and Maintenance Building. The runway and taxiway are finished at present, and there are two contractors now working on the basic utilities and the construction of the Passenger Terminal Building.

Need for the new International Airport was evident many years ago when traffic loads at the present San Juan airport showed rapid increases. In 1947, the Transportation Authority acquired a U. S. Navy hangar at the airport and converted it into a passenger terminal. In less than a year its facilities were already being overtaxed. A boom in Puerto Rico's tourist industry, and the growth in its general economy that brought thousands of businessmen and their families to Puerto Rico, made the new airport program a necessity. The Transportation Authority's traffic records last June showed passengers being cleared at the rate of nearly 40,000 a month. with prospects that the figure would far exceed this within a year. Since plans for the new airport at Isla Verde did not anticipate this traffic peak until 1954, when the terminal is expected to go into service, both the terminal construction plans and the traffic estimates have been revised to take care of the unexpected boom.

The cost estimates for the new airport are around $15.-000,000, of which the Insular Government has already appropriated more than half as its share. Under the Federal Airport Act of 1936, the United States will also provide five million dollars toward the project, and two-and-one-half million dollars of the latter sum have already come from Washington.

The Secretariat of Public Works and the Puerto Rico Planning Board programs also include provision for the construction of a new highway from the center of San Juan directly to the new airport, another recommendation included in the Doolittle report as essential to good air transport operations.

As another major project, the Puerto Rico Transportation Authority has undertaken the expansion of its harbor facilities by developing the south side of the Bay of San Juan. At present, it has completed bulkhead facilities for two berths and it is constructing two transit sheds, 400 feet long by 130 feet wide. Plans are under way to extend the bulkhead to accommodate four additional berths and develop the area in back of the bulkhead with adequate warehouse facilities and a central market which will help the agricultural commerce of the island.

Finally, with the assistance of engineers, architects, and many more experts, the Government has tackled the housing problem with a program aimed at the elimination of present slum areas and the prevention of others in the future. In rural areas the program calls for the construction of schools, rural electrification systems, medical centers and dispensaries, paved roads, water supply systems, playground and recreation areas, and industrial plants and the organization of cooperatives.

In urban centers, a partial solution is being sought through an ambitious, low-rent public housing program authorized under the Housing Act of 1949. Under this program, 9,839 apartment-type dwelling units are under construction, and about 7,100 are in the planning stage. In addition, there are 5,920 relatively new units which were constructed under the 1937 Housing Act.

This is only a beginning, but a progressive slum-clearance campaign is another essential element in the transformation of Puerto Rico into a multi-industry country since a better-housed population means better-satisfied, more efficient workers.

This then, in summary, is a bird's-eye picture of Puerto Rico today—a populous island whose people are resolutely and energetically, with the assistance of the United States, creating a new field for industrial development and where the professional engineer is indeed the man of the hour.—*End.*

(A biographical sketch of Mr. Hernandez appears on page 49.)

An *American Engineer* SPECIAL REPORT

Re: *Conger Reynolds' Community Relations Survey*

• Elsewhere in this issue of the American Engineer, Leland I. Doan, president of The Dow Chemical Company, has written of the need for continuing "public consciousness" on the part of business and industry. (See page 9.) Among other things this, of course, means maintaining good public relations; and a most essential phase of the public relations problem hinges on the grass roots relationship of an industry to the community in which it is located. Good community relations are important to everyone within an industry or business—administrators and professional engineers, scientific research personnel and clerical staff members—because the maintenance of local goodwill promotes smooth operation and helps in the sale of goods and services.

All this boils down to "the simple business of being a good neighbor," says Conger Reynolds, P.R. director of Standard Oil of Indiana. "The first social responsibility of any business is, of course, to operate honestly and fairly. . . . But good social behavior in business extends also into doing many extra, helpful things that make life in the community better."

And Mr. Reynolds is a man who knows the community relations score very well indeed. In preparation for a speech on this subject, scheduled for delivery before several U. S. Chamber of Commerce "Explaining Your Business" conferences, he reviewed the community relations programs and activities of some forty representative companies and associations and came up with some very interesting case histories and observations.

"There are two ways you can go about improving your relations with the community," he told his audiences:

"1. You can do specific things or develop a complete program of activities of your own.

"2. You can join with other local businesses in one big campaign for improved relations between business and community—and for better understanding of American free enterprise."

Good deeds plus effective communications techniques constitute the essentials of any community relations program, according to Mr. Reynolds' findings; and it is as important to maintain good communications with employees as it is to maintain them with the local citizens in general. Furthermore, he pointed out, "You have to listen to what your neighbors are saying. The communication must be in both directions if it is to be effective." As an illustration of this latter point, he cited the Ethyl Corporation's community polls in Baton Rouge, La., which have provided a succinct picture of the local citizens' opinion of the firm.

Treating newsmen fairly when company news is bad, as in the case of fires or accidents, as well as providing them with more flattering releases, is another very important factor in the community relations picture, Mr. Reynolds reported. The Quaker Oats annual press dinners serve to build such good press relations, he said, and this example is easy to follow.

Nor is the "most glamorous of all public relations tools"—the motion picture—beyond the reach of all but the giant corporation, he remarked. While citing such examples as the Cluett-Peabody film, "Enterprise," showing the industrial revival of Buchanan, Georgia, and the Studebaker Corporation's special centennial movie that attracted 40,000 South Bend, Ind., citizens, he was quick to point out that for a few hundred dollars it is also possible to turn out a home-made movie that will serve some special community purpose.

Plant tours, special exhibits, radio programs, advertising space devoted to boosting civic pride, school programs and contests, business-industry-education days, and participation in community celebrations and civic welfare campaigns were among the many items that Mr. Reynolds listed as effective promoters of good community relations.

Unusual undertakings that he discovered included:

—The "post prom" party for the high school students of West Allis, Wis., sponsored by Allis-Chalmers and the local Rotarians.

—The opening of the Dravo Corporation's swimming pool to all children on Neville Island, ten miles south of Pittsburgh.

—The annual dinner for local ministers and teachers given by the Camas division of the Crown Zellerbach Corporation.

—The "Industrial Expansion Day" sponsored in Bridgeton, New Jersey, by the local Manufacturers Association, during which the representatives of 24 national companies were shown the city's industrial facilities at first hand as a move to counteract a rumor that local industry was keeping new industry out of the town.

"There is no community in America without its representatives of American business and industry," Mr. Conger emphasizes, in summarizing the results of his study. "If every such representative will work seriously at building understanding in the community, there will be much less need of public relations campaigns on a regional and national scale, by the oil industry or any other industry, by the National Association of Manufacturers, or by the U. S. Chamber of Commerce. . . . The public relations job will have been done for all business where it can be done best—across the back fence."

NSPE Board Members Decline Affiliation with EJC, 69–12; Approve New Hqs. Building

At their fall meeting held in Indianapolis, NSPE's Board of Directors voted 69-12 against joining the Engineers' Joint Council at this time, in probably the most significant action of the two-day affair. (*See other unity story on this page.*)

In other actions the Board:

- **Authorized the purchase of a lot in Washington, D. C., and the erection of a new Headquarters building for the Society, not to exceed $230,000** **(See other story this page.)**
- **Approved support of voluntary social security coverage and indicated acceptance of mandatory coverage if the earning limitation is removed**
- **Approved an extensive 1954 program directed toward greater recognition of young engineers**

A more detailed reporting on the important subjects discussed by the Board officials follows:

Evaluation of Objectives

Consideration was given to the best procedure for periodic review of the Society's activities as compared with the original objectives of the Society, and it was decided that there should be a Committee on Evaluation of Objectives every five years to make a separate independent

(*Continued on next page*)

Decision by Board on EJC Proposal Made After Careful Study of Report by NSPE Observers

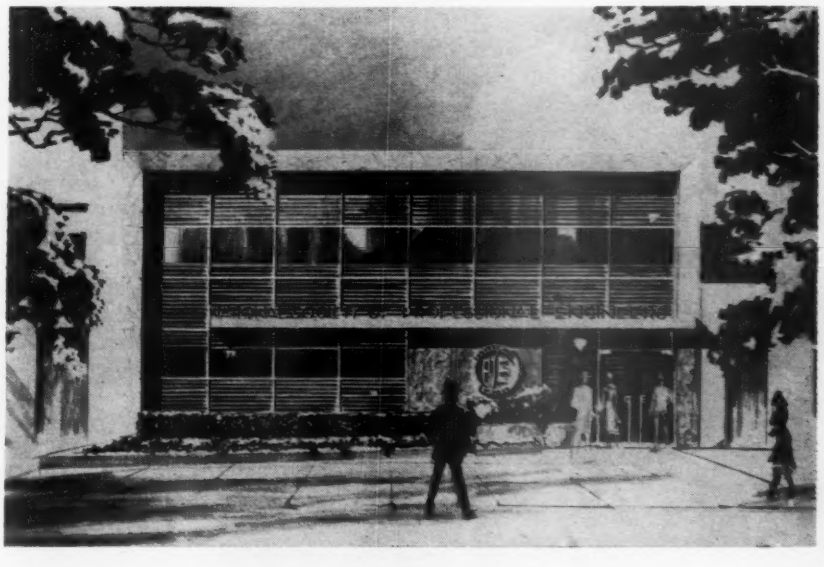
Rejection of the invitation to NSPE to join EJC, came after many months of deliberation that followed its issuance by EJC last spring. The matter was originally considered by the NSPE Board at its Annual Meeting in June 1953, at which time a number of questions concerning the relationship between the two organizations were raised. At the June meeting, the Board requested that representatives of NSPE meet with representatives of EJC to discuss a number of specific questions that were then raised and to determine, where possible, the solutions to several perplexing problems.

The results of these meetings were reported in detail to the NSPE Board at Indianapolis, and the advantages of the proposed affiliation, together with problems anticipated, were considered at length. Following the discussions, the Board expressed the belief that effective professional action could be accomplished only through an integrated, three-level organization composed of individual members. Since EJC does not now operate within such a framework, the Board voted to decline the invitation at this time.

See page 44 of this issue for complete report made to the Board by the three NSPE Observers at EJC meetings.

Board Acts on Hqs. Housing Problem

Chairman Sidney L. Stolte of the Headquarters Housing Advisors presented to the Board a comprehensive and detailed report on the present and future anticipated space requirements of the Washington Headquarters Office and an analysis of selected rental areas compared with purchase of a lot and erection of an NSPE Headquarters Building. The Board authorized the purchase of a lot on which an option had been taken in conformance with previous Board authorization, located at 2029 K St., N.W., Washington, D. C., and the erection of a suitable building (see cut) at a total expenditure not to exceed $230,000. The officers were authorized to finance the construction through an interim loan and the sale of bonds to the members in denominations to be fixed by the Executive Committee and with interest not to exceed 4½%. Authorization was also given to extend the lease on the present headquarters space and to rent such additional space as may be necessary pending the availability of the new Headquarters Offices.



The design of the building as shown in the drawing will make available for office space a full basement in addition to two other floors. The building is centrally located.

study of the intervening period. This Committee will evaluate progress, programs and major developments and report to the Board pertinent observations on the Society's adherence to constitutional objectives.

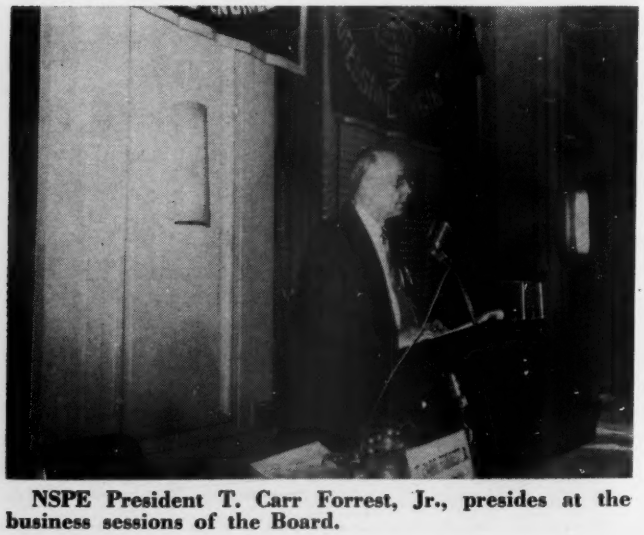
Legislation

Chairman Dan H. Pletta presented the report of the Legislative Committee covering a number of current legislative items. On the question of social security coverage for self-employed professional engineers, he reported that the poll conducted through the AMERICAN ENGINEER disclosed 54.6% against mandatory coverage and 45.4% for mandatory coverage. A substantial number of those against pointed to the limitation of $75 per month in covered earnings after the age of 65 without loss of retirement benefits. The Board approved the following two-point policy for NSPE: (1) support voluntary coverage on an individual-choice basis, (2) indicate acceptance of mandatory coverage if the earning limitation is removed.

Other legislative items briefly reported included: legislation to permit self-employed and persons not covered by pensions to set aside a tax-deferred portion of their earnings for retirement purposes, a bill to permit professional persons to deduct sums paid for improving professional qualifications through special courses of study, investigation of classifications and rates of pay of federally-employed engineers, military manpower policies and procedures, amendment of Officer Personnel Act (Navy) and Air Force Organization Act to recognize professional status of professional engineers in those services, and utilization of private enterprise in the development of natural resources.

Chairman Ryan of the Employment Practices Committee and Chairman Pletta of the Legislative Committee commented on the proposal of the New York State Society that registered professionals should be "excluded" from the provisions of the labor law. Both chairmen recommended against the proposal. Representatives of NYSSPE spoke in favor of the amendment. After a thorough floor discussion, the Board voted to approve the recommendations of the Legislative and Employment Practices Committees. This action maintains the NSPE position favoring continuation of the present professional provisions of the law, plus the "Freedom of Association" amendment.

(A news story covering the social highlights of the Indianapolis meeting will be found on page 34.)



NSPE President T. Carr Forrest, Jr., presides at the business sessions of the Board.

Registration

Chairman Orland Mayer outlined the main areas of the Registration Committee's current and anticipated activities, concentrating primarily on improvements in the registration laws and the Model Law, administration of state laws, and reciprocal registration. Several studies were suggested in these fields and the Committee is to develop the details and procedures to implement some of the suggested fields of study. A summary report was given on the experience of the Alabama Society in connection with an attempt to modify the eminence clause and the survey results on that matter. Information on citizenship requirements of state registration acts, as compiled by Past President John D. Coleman, was also reported.

Compendium of Registration Laws

Senator A. L. McCawley of Missouri presented latest developments in his work to publish a compendium of engineering registration laws and distributed sample chapters. The Board approved an Executive Committee recommendation that NSPE advance publication funds for this purpose, not to exceed $5,500, which will be repaid from the sale of the completed work. NSPE will also assist in the pre-publication promotion of the book, the details of the arrangements to be developed between Senator McCawley and a committee headed by Vice President C. Y. Thomas.

Interprofessional Relations

Chairman Frank Wooten informed the Board that the Committee is in the process of making a survey of all state societies to learn the effectiveness of earlier requests for the establishment of State-level Interprofessional Relations Committees. Joint meetings are being planned with other professions and study is being given to suggested clarifications of the Code of Engineer-Architect Practice as developed by the Massachusetts Society and the Architect's Society of that state, and approved by the Board at the previous meeting.

Ethical Practices

Chairman Leslie Gates reported to the Board that a survey of practice of State Societies regarding telephone listing arrangements is to be conducted in an endeavor to formulate a national uniform policy on the subject. Further study is needed for the final suggested wording of an "Engineers' Creed." The Committee endorsed the recommendation that a Board of Ethical Review be established and the details of such a body are to be further studied and a report filed at the next meeting. The proposed Board will receive, analyze and recommend on specific cases of actual or alleged ethical violations and present the findings to the Board for final policy action.

National Defense

Chairman Chester Lichtenberg presented a comprehensive report of the recent activities of the National Defense Committee. Major topics of interest are a suggested revision of the duties of the committee, legislation affecting professional engineers in national defense, status of professional engineers in national defense, utilization of professional engineers in national defense, and civil defense. The Legislative Committee was directed to continue its efforts to seek amendment of the Air Force Organiza-

tion Act and Officer Personnel Act in order that professional engineers be accorded proper recognition and that these items be reported to the Board at each meeting until successfully concluded. Other legislative items involved in the committee's work include: Armed Forces Reserve Act, Army-Navy Medical Services Corps Act, Reserve Officers Personnel Act, Uniformed Services Contingency Option Act. A number of valuable supplements on particular phases of national defense interest were distributed to the Board.

Young Engineers

Chairman E. W. Carlton outlined a comprehensive program for greater recognition of young engineers. Among the recommendations which were suggested for implementation are: preparation of a brochure listing professional objectives, professional obligations, service opportunities and benefits offered to new young members; development of a full young engineer program at the state level; assistance to engineering seniors in preparing for professional registration, including refresher courses; preparation of an NSPE Student Chapter Handbook; encouragement of cooperative and joint meetings between student chapters and state societies, and also of the interchange of ideas through organization of regional conferences of student chapters. The following recommendations were referred to the Constitution and Bylaws Committee for study and report: Change name of "engineer-in-training," to "engineer-member;" encourage state registration boards to recognize such a change in designation; permit full society voting privileges for young engineer members; amend constitution to permit a young engineer Director-at-Large from each of the six administrative areas, as a full voting member of the Board. Other specific suggestions to implement the program were referred to the Education Committee.

Education

The Education Committee report, presented in the absence of Chairman Willis R. Woolrich, stressed cooperative activities with the educational institutions to prevent unwarranted invasion of unionism philosophy on the campuses of the engineering schools. The threatened move to put student chapters of ESA on each engineering college campus has been stopped, at least at this time. Continued vigilance on this point is necessary for the years ahead. The Committee proposed that a panel discussion be held at the Annual Meeting in Milwaukee next June to give the entire NSPE some preview of the future of engineering education. More work needs to be done to give the graduating engineer a plan of study for four years after graduation to help him in professional understanding, as well as in connection with his registration examination.

Employment Practices

Chairman A. J. Ryan reported on a number of items before the Employment Practices Committee and action was taken as follows: the committee was instructed to give further study to the question of "gentlemen's agreements" which prevent employees from seeking new employment in an industry unless the current employer consents and to present a policy statement on the subject to the next meeting; the Executive Committee was instructed to initiate new intensive efforts to establish a means of accomplishing an effective unification of the profession; the Washington Office was instructed to begin intensified action toward having registration included as a Civil Service requirement for the certification of individuals for engineering positions in the Federal Government. The following suggestions were referred to appropriate committees for study and with a favorable recommendation: establishment of a program to determine the professional status of the membership of collective bargaining groups and the reported objectives of all organizations which represent themselves as collective bargaining agencies for engineers; compilation of information pertaining to the income of other segments of society to supplement the NSPE Salary Survey; conducting of active programs for EIT members.

Ohio Turnpike Unionization Case

Colonel Charles P. Smith, President, Ohio Society, informed the Board of a development among professional engineer and surveyor employees of contractors engaged in building the Ohio Turnpike whereby such persons are being forced into a trade union. At the request of the Ohio Society, the Board acted to send an NSPE observer to Ohio to ascertain and report the facts to the Executive Committee and further to authorize NSPE to assist the Ohio Society if the case takes the form of legal action to prevent the forced inclusion of professional employees in the union.

Public Relations

Chairman Edwin Seeger outlined the major P.R. activities of recent months and anticipated programs and Chairman Anatole Gruehr of the Engineers' Week Subcommittee developed activities in connection with the forthcoming observance next February. Representatives of the Indiana Society and the local chapter presented a discussion of P.R. activities at the state and local level. The third Executive Research Survey Report, "How to Attract and Hold Engineering Talent," is in the final stages of presentation and will be available by the end of this year. The Engineers' Week material is fully distributed and will be supplemented by radio tape recordings and a television film.

Membership

Chairman Robert Allen outlined the 1953 membership promotion program and distributed copies of the promotional literature which is being made available. A monthly Membership Memo has been started and will serve as an informational and coordination publication. Membership gain has been impressive—as of the end of October the membership exceeded 31,000. National Director Joe Butler of Missouri reported on his "one man" membership promotion campaign which has produced outstanding results.

Future Meetings

The future meeting schedule, including actions at the Indianapolis meeting is:

Spring, 1954, Board of Directors—Albuquerque, New Mexico, February 19-20, 1954.

Annual Meeting & Board of Directors—Milwaukee, Wisconsin, June 10-12, 1954.

Fall, 1954, Board of Directors—Omaha, Nebraska, October 15, 16, 1954.

State Presidents' Conference—Pittsburgh, Pennsylvania, (date to be determined) 1954.

Spring, 1955, Board Meeting and State Presidents' Conference—Washington, D. C. (date to be determined).—***End.***

Now Santa Is An Engineer!

Increased strength and added safety features are among the many improvements made in the redesigned model aerial ladder truck, recently introduced by The Charles Wm. Doepke Mfg. Co., Rossmoyne, Ohio.

ONE of the major displacements attributable to the Industrial Revolution has been the decentralization and removal of Santa Claus' workshop from its traditional location at the North Pole to a variety of factories equipped with the very latest research and manufacturing facilities. Another amazing thing is the fact that each year more and more engineers are being employed to staff Operation Christmas. Let's visit two leading firms who will again this year rely upon their technical talent to make the things many a youngster dreams of.

TAKE, for example, the Lionel Corporation of Irvington, New Jersey, manufacturers of the model electric trains without which no American Christmas would be complete. Of the 3,000 persons employed by the firm, nearly 100 either have engineering degrees or at least some engineering training. And the chief engineer, Joseph L. Bonanno, P.E., is, incidentally, a member of the New Jersey Society of Professional Engineers.

It is his staff that brings each new item into existence, charts its course through production, and follows it to effect improvements in both the finished train and production methods. Thus, the role of engineers in the Lionel organization can best be understood by following the course of a single item from planning through production.

Until a few years ago, all Lionel locomotives were replicas of steam locomotives then in general use. As modern railroads changed to diesel-propelled engines, however, this called for a change in the Lionel line since model railroad fans of six or sixty are sticklers for realism. After a study of many of the new models, the sleek colorful Santa Fe diesel was selected as the first one most likely to appeal to the imagination of model railroaders.

Pursuing its usual procedure, the company requested photos and the original blueprints from the railroad, and then the engineers went to work. The plans were scaled down to Lionel standards, one quarter of an inch to a foot. Next a plaster mock-up was made for study. Finally, a working model, complete in every detail, was produced for minute examination.

This first model, painstakingly made by hand, served many purposes. First of all, it had to be determined by actual operation if it would negotiate switches and minimum curves and be adaptable to over-all operation. Secondly, it also served as a pattern for establishing manufacturing costs and deciding its practicability as a mass-production item.

Introduction of this new item required the complete redesign of all locomotive components, including a new motor and a horn to replace the whistle. Likewise, new wheels and trucks were needed to simulate those in use on its diesel prototype. Thus the modernization of American railroads provided a new challenge for Lionel engineers.

The new locomotive required more than two hundred and fifty components. Consequently, engineers had to explore the entire field to determine those best suited and most economical for the production of each part. Then, with all of these components on hand, assembly procedure had to be studied to adapt it to mass-production.

About the time the Santa Fe was being developed, a powder metallurgy laboratory was also set up to determine the feasibility of producing parts from metal powder. It was found that wheels, gears, bearings and scores of similar components could be manufactured far more economically by this method. In fact, complete subassemblies, consisting of a number of parts, are now produced as a single unit at a very substantial saving.

Planning new products, designing tools, dies and special machinery not obtainable on the market as well as searching for better materials and methods are only a portion of the engineers' responsibilities at Lionel. Theirs is a never-ending quest for product improvements through an intensive quality control program as well.

One phase of this quality control program is the development of testing equipment to check a wide variety of items at every stage of production. In addition, finished goods are selected at random from assembly lines and subjected to life tests. Such items are operated continuously until they wear out. Then they go to the Engineering Department for careful study to bring about such changes in design or material as may be required to extend the operating life of the equipment.

Lionel employs virtually every manufacturing method in existence, such as die-casting, moulding, stamping, powder metallurgy and screw machine work. Thus it also requires

Top, photo: Calipers enable this Lionel engineer to make comparison between the original mock-up of diesel locomotive and hand-made model in one of the early stages of development. Bottom, photo: The Powder Metallurgy Laboratory at Lionel produces hundreds of experimental parts. This photo shows Lionel's Chief Engineer Joseph L. Bonanno, P.E., a member of the New Jersey SPE, examining an item as it is drawn from the sintering furnace by a metallurgist.

men with a wide variety of special talents. Among these are design, material, tool, project, processing, electrical and electronic engineers.

Actually, its problems are simliar to those of the railroads but on a smaller scale, of course. They are particularly complex because of two factors. Its product is subject to abuse by children, and it must be designed to withstand that abuse. On the other hand, the use of electricity necessitates careful consideration of the safety element.

A progressive firm must also plan far into the future and the company's development work frequently is many years in advance of production. In fact, one section of the Engineering Department, housed in a secluded area, does nothing else but develop new products that one year or five years later may be found under Christmas trees throughout the country.

This is the contribution of engineering and American ingenuity to one of the nation's popular diversions—a hobby that is worth more than $50 million in sales annually and that requires enough mileage in miniature tracks each year to cover the distance from New York to the Pacific coast.

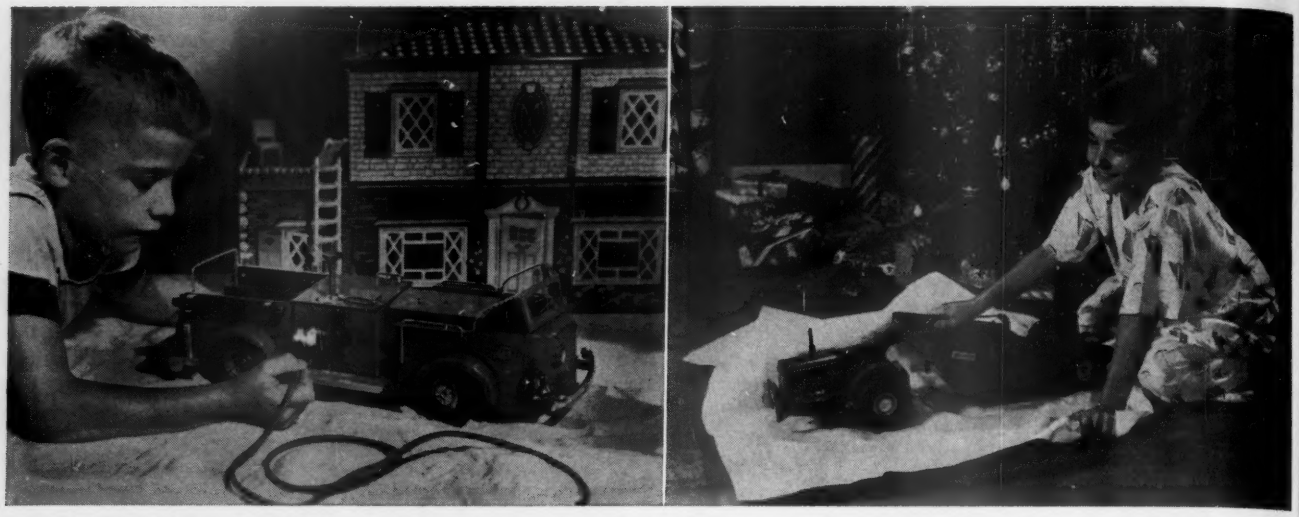
In addition to electric trains, tomorrow's engineers—and today's parents, whether P.E.'s or not—have recently been asking Santa to leave one or more models of the Doepke brothers' junior-size earth-moving machines or fire engines under their trees on December 25th. The Charles William Doepke Manufacturing Company of Rossmoyne, Ohio, is a relative newcomer to the field, having slipped quietly into toy production only as late as 1946, but it is making other manufacturers sit up and take notice.

Last year's production totaled 270,000 of the officially authorized, carefully engineered toys, and this year's figure should top that by a good margin. A new $40,000 research and engineering building has just been completed on the firm's Rossmoyne acreage, where a staff of five designers will work under the direction of chief engineer Ott Moehringer, and the company is ready for an even bigger year in 1954.

The model toys, which actually perform like their full-size prototypes, are the brain-children of two brothers from Cincinnati—Fred W. ("Fritz") and Charles Doepke. By late 1945, the wheels of the wartime manufacturing operation which Charles, a Purdue engineering graduate, had been directing in Cincinnati were grinding to a virtual standstill; and he and his brother, recently returned from a stint as a fighter pilot, were searching for a new product that they might manufacture and market. They needed an item they could stamp, press, and emboss in metal because those were the operations their machines could perform, but so far their search had been unsuccessful.

Inspiration, however, was just around the corner; and it came, fittingly enough, because Fred brought an old toy of his own—a water truck—into the factory to fix up as a "Christmas present for the kids." The truck itself was made of wood, but in repairing it the brothers suddenly became aware that there wasn't a part which could not be stamped, pressed, or embossed in metal. That realization, plus Fred's reminiscences about the giant earth

Each item at the Lionel factory is fully inspected and tested before it reaches the end of the assembly line. Each locomotive, after being inspected, travels under its own power to the packer.



Left: This fire engine by Doepke is based on one made by American LaFrance-Foamite Company, and will throw a stream of water nearly twenty feet. Right: Steel scale model of giant Heiliner earth scraper and mover is typical of line of eight Model Toys produced by Charles William Doepke Mfg. Co.

movers and tractors he had seen the Seabees using during the war, gave the brothers their big idea. They would manufacture quality toys, faithful reproductions of fire engines and construction equipment.

Their first successfully mass-produced toy was a Wooldridge dump truck, but there were a great many headaches still in store before a full line of Model Toys was coming off the production line and before they were able to transfer operations from the old plant to a new brick-and-steel facility at Rossmoyne, twelve miles north of Cincinnati.

One of the biggest problems was to convince buyers for the large retail and chain stores that parents would actually buy the fairly expensive toys for their children in sufficient quantities to warrant a store's carrying the line. Not to be stopped by initial objections, however, the ambitious brothers undertook what was almost a store by store tour of the country and also literally gave away many sample toys to friends' children and to children's hospitals, sanitariums, and clinics, asking only that the reaction of the youngsters be reported to them. Ultimately then, it was the children's whole-hearted enthusiasm for the toys that really put the Doepkes in big business.

It is an interesting experience to follow a typical Doepke toy through production.—A few steps inside the rear door of the new factory, flat sheets of 18-gauge steel disappear between the blades of a heavy cutter. Seconds later the strips and panels have moved along to the pressing and stamping machines. A steady stream of oddly shaped parts clank down into metal rolling bins. Then across the aisle, as a battery of spot welders work on the pieces in a constant shower of glowing sparks, the parts, fused by a jolt of low-voltage current, begin to take the recognizable shape of a tractor body. As it is pushed along an oil rack at eye level, the tractor is given a driver's seat, a scraper blade, miniatuure headlights, and two sets of treads.

Then an overhead conveyor picks up the unadorned gray-steel tractor, and after a chemical degreasing bath, the toy is carried into the paint room to receive a baked-enamel finish of Caterpillar yellow. A few feet from the oven exit, several workmen check the toy to see that it is working properly and attach a few small parts and decals that give it a "true-to-life" look; and the model—an authorized reproduction of the Caterpillar tractor—is ready for final inspection.

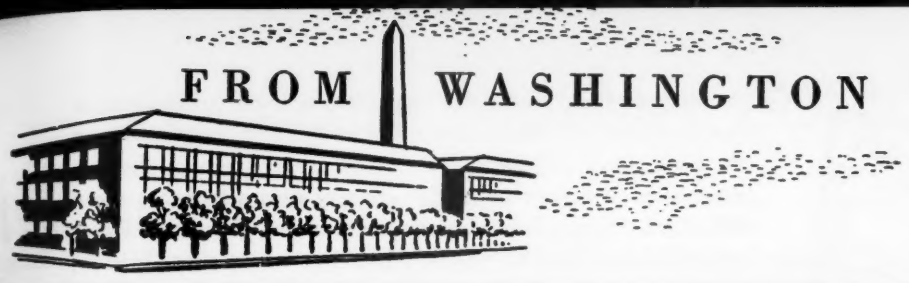
New models are constantly being added to the Doepke line, one of the latest being a scale model of a bucket loader made by the Barber-Greene Company of Aurora, Illinois. Like the other toys produced at the Rossmoyne plant, the bucket loader is an action toy. It rolls on four rubber tires, can be steered, can be adjusted to two different positions, and has a moving system of buckets and a conveyor.

All movable parts of the loading and dumping system are operated by a single crank. This crank turns a loading screw that brings sand or gravel to the buckets at the rear. At the same time the buckets, mounted on two steel chains, turn and scoop up the sand or gravel, carry it to the top of the 14-inch inclined bucket track where the sand or gravel falls out onto a rubber conveyor belt operated by the same crank that moves the loading screw and buckets. The belt moves about 16 inches along a horizontal boom, and the sand or gravel falls off the end of the boom. An earth hauler parked at the end of the boom can catch the sand as it falls.

That would be quite a toy to find under a Christmas tree, and it is only one of the many now pouring out of the Rossmoyne plant to win new plaudits for the Doepkes. There was one item produced not too long ago, however, that won them something a little less than applause—a concrete mixer, a miniature copy of a nationally-known machine, that actually made concrete! Obviously the engineering behind the toy was perfect, but unfortunately there was no perfect answer for the parent who returned the solidly concrete-packed mixer with the caustic comment: "All right, wise guy, let's see *you* get the concrete out of this thing."

The Doepke Company numbers many more than children among its customers, as salesmen frequently use the models when visiting potential buyers and the Army Engineers employ them for classroom instruction.

Meanwhile all predictions indicate that 1953 will be a big year for Santa Claus and his many first-quality authentically engineered toys—electric trains, earth movers, fire engines, and a host of others.—***End.***



Milton F. Lunch,
By
N.S.P.E.'s Legislative Analyst

President Eisenhower will meet with Republican Congressional leaders on December 17, 18, and 19 to map administration plans for legislative action at the next session of Congress which starts on January 6, 1954. It is uniformly agreed, regardless of political faith or affiliation, that the pressure is on the administration to produce a concrete program of legislative accomplishment in the Second Session. The record which is written in the halls of Congress during the first six months of 1954 will undoubtedly be a major factor influencing the Congressional elections of 1954, determining whether the administration receives a vote of confidence or is rejected in favor of a return to Democratic control.

The major topics on which action is expected are well known: amendment of Taft-Hartley, aid to agriculture, foreign aid, military expenditures, and extension of social security. Of these selected subjects, the one which is expected to have the easiest passage through the political fires is the last one. This report is devoted to an analysis of social security extension as it may affect the engineering profession, and particularly the self-employed professional engineers of the nation.

The background of the question of extending social security to the self-employed professional engineers (other self-employed professionals are also excluded) was contained in the September, 1953, issue of the AMERICAN ENGINEER in connection with a poll of the self-employed members of NSPE on the question. A considerable number of votes were received and the results were: 54.6% against mandatory coverage and 45.4% for mandatory coverage. While this may appear to be a fairly close result, it is not as evenly divided, for instance, as a similar poll conducted by the American Dental Association in 1951 which resulted in a vote of 51.7% "against" and 48.3% "for."

Before reaching definitive conclusions about the results, it is necessary to examine the reasons given by the respondents. They can be divided into two categories for each side and a selected quotation on each point should serve to dramatically illustrate the philosophy of the voters in the appropriate category.

AGAINST—1. A political or economic philosophy opposing government intervention in private affairs — "I am opposed to all forms of compulsory control by the Federal Government. I believe this philosophy precludes individual thinking and planning. It stifles individual incentive. It stagnates progress!"

2. The fact that if the practitioner continues practice after the age of 65 and earns more than a stipulated amount (now $900 per year), he will not draw the retirement benefits after having paid into the fund—"I am 70 years of age and at present I and my wife are drawing social security which was earned before retiring. I am at present practicing engineering and if again covered I would have to contribute and my present social security benefits would be stopped."

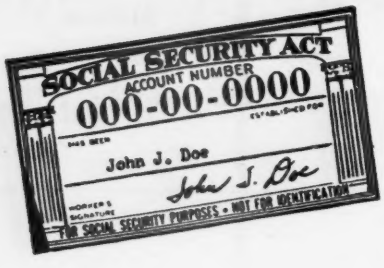
FOR—1. Social security is the least expensive form of retirement insurance and the younger practitioners cannot afford a private plan offering the same benefits—"I am voting for it for the simple reason that it is one of the cheapest retirement insurances in existence at present beneficial to those who are in real need of it."

2. Social security is here to stay, most persons are covered, and many private practitioners were under it when they were employees; hence their coverage should be maintained on a continuous basis —"From a strictly business standpoint, I would like to continue under coverage because when I entered business on my own account I had already paid into the fund thirty-six full quarters, leaving four quarters still to be paid to be eligible for the full benefits."

With these basic facts before them the NSPE Board of Directors adopted a two-point policy at the recent Indianapolis meeting:

1. Support voluntary coverage on an individual-choice basis.
2. Indicate to the Congressional committees, during the course of testimony, that mandatory coverage would be acceptable if the earning limitation ($900 per year) is removed.

(Please turn the page)



Both of these points are subject to political and economic considerations and these considerations indicate that, insofar as the professional self-employed groups are concerned, the administration program on social security extension faces some difficulties. Regarding voluntary coverage, President Eisenhower and Secretary of Health, Education, and Welfare Hobby, as well as the Social Security "experts" have recommended mandatory rather than voluntary coverage of the professional groups. The reason given for opposing voluntary coverage is illustrated by a comment of a group of consultants headed by Mr. Reinhard A. Hohaus, vice president and chief actuary, Metropolitan Life Insurance Company: "Under a program such as old-age and survivors insurance, which in many cases, especially in the early years and for workers with large families, pays benefits considerably in excess of the value of contributions, the opportunity for individual voluntary coverage is likely to have serious effects on the financing of the program if made available to any large number of people." Basically the same point was made by another group of consultants in 1948, headed by the late Edward R. Stettinius, Jr., at which time it was said: "Voluntary coverage . . . has been suggested. In the opinion of the Council (advisors), voluntary coverage is defensible only where the Federal Government cannot under the Constitution apply compulsion. . . . Since the chief objective of the old-age and survivors insurance program is basic family protection adequate for the needs that can be presumed to exist in various family situations, the program contains eligibility and benefit provisions which, especially in the early years of operation and in the case of workers with large families, allow for the payments of benefits considerably in excess of the value of contributions. These provisions make the program vulnerable if voluntary participation by individuals is allowed. The 'adverse selection' which would occur would have serious effects on the program's solvency."

These views, also supported by the Social Security Administration, do not necessarily preclude the idea of voluntary coverage for selected groups—such as the professionals. But it is possible that if voluntary coverage is the only "good" answer for professional or other groups, Congress might insist upon some financing arrangement for those groups to offset the "adverse selection" theory. One suggestion along this line is to provide for a sliding scale of contributions (premiums) for those who elect voluntary coverage, much as private life insurance premiums vary according to the risk.

The obvious comment on removal of the earning limitation (if the limitation were removed it would have to be removed for all covered persons and not just the professional group) is that the number of persons eligible for benefits would go up, the drain on the fund would increase and to maintain an actuarially sound system it would be necessary to increase the contribution rate substantially. The rate for employees and employers (based on $3,600 of income) amounts to $108 in 1953, increasing to $234 in 1970 and thereafter, and for self-employed from $81 in 1953 to $175 in 1970 and thereafter. It has been unofficially estimated that the removal of the earning limitation would require an increase of approximately 50% in the contribution rates. Even should the employees and the self-employed accept the increase to gain the sure right of receiving retirement payments at the age of 65, it may be anticipated that the employers would strongly oppose the added cost to their contribution which is for hundreds or thousands of employees and is a considerable item in total operating costs.

The more likely alternative solution is to increase the limitation from the present $75 per month ($900 per year for self-employed) to a somewhat higher figure. President Eisenhower's recommendations do not touch on this point but a substantial number of members of Congress (perhaps even a majority) have openly contended for such a change. The suggestions for increasing the limitation range from $100 per month to as high as $200 per month. Should the limitation figure be raised to $100 per month it is possible that the increased costs against the fund could be absorbed in view of the administration's past request (not acted upon by Congress at the first session) that the scheduled increase in the rate to take effect January 1, 1954, from 1½% to 2% for employees and employers and from 2¼% to 3% for self-employed, be deferred until a new actuarial study can be made of the accumulated fund which now totals some 18 billion dollars.

Where do the other major professional societies stand on this question? The American Medical Association is opposed to inclusion of doctors; the American Bar Association stand is not quite as clear, but the latest official action of the ABA is against inclusion of lawyers; the American Dental Association poll has been mentioned previously and would indicate opposition to coverage. Against these powerful professional groups stands the clear recommendation of President Eisenhower and his Secretary of Health, Education and Welfare.

That part of the upcoming administration legislative program which involves extension of social security, insofar as the professional groups are concerned, may turn out to be something more than "one of the less controversial planks in the program."

Committee Nominates 1954-55 Slate

A PROMINENT Allentown, Pennsylvania, engineer, long active in National Society programs, has been named to head the slate of 1954-55 candidates for NSPE office selected by the organization's Nominating Committee. He is Clarence T. Shoch, assistant to the vice president, Commercial Department, Pennsylvania Power and Light Company, and currently NSPE vice president for the Northeastern Area.

Vice presidential nominees selected by the committee are: Louis B. Frazza, Northeastern Area; M. F. Wooten, Jr., Southeastern Area; Virgil E. Gunlock, Central Area; John B. Jardine, North Central Area; R. J. Rhinehart, Southwestern Area; and Orland C. Mayer, Western Area. Russell B. Allen was also nominated for treasurer.

In announcing its selections, the Nominating Committee pointed out that additional nominations may be made by members as provided in the Constitution. The names will be placed on the official ballot upon petition of fifty members, all in good standing, provided such petition is received at least one week prior to the printing of the official ballot. The closing date for such petitions will be January 10, 1954, and they should be sent to NSPE's Washington office.

Members of the Nominating Committee are: L. L. Dresser, chairman, Louis T. Klauder, Orbie Bostick, Walter Johnson, L. E. Easley, and W. W. Bergerson.

Following are brief biographical sketches of the committee's choices for Society leadership.

CLARENCE T. SHOCH of Allentown, Pa., who has been nominated for the NSPE presidency, is a graduate of the Drexel Institute of Technology from which he received his B.S. in Electrical Engineering in 1924. He is also a member of Tau Beta Pi.

Clarence T. Shoch

Employed July 7, 1924, by the Pennsylvania Power and Light Company as an instrument man, he later became successively a test engineer, field engineer, boiler-room engineer, plant betterment engineer, industrial sales representative, industrial sales manager and, finally, assistant to the vice president of the Commercial Department. He has also done engineering work for the Commonwealth of Pennsylvania and maintained a private consulting office.

He obtained his P. E. license in the State of Pennsylvania in 1931, and in 1937 he joined the Lehigh Valley Chapter of the Pennsylvania Society of Professional Engineers. He has been president and state director of the Lehigh Valley Chapter, president of the Pennsylvania SPE, NSPE national director, and NSPE Legislative Committee chairman. He is currently serving as vice president for the Northeastern Area and as chairman of the National Affairs Committee.

He is also active in the American Institute of Electrical Engineers, the Engineers Club of Philadelphia, Engineers Club of the Lehigh Valley, Edison Electric Institute, Pennsylvania Electric Association, Interstate Power Club of New York (past president), Industrial Electrification Council (charter committee), and the Allentown Chamber of Commerce. He participates in many other civic activities, including work with the Boy Scouts of America.

Louis B. Frazza

LOUIS B. FRAZZA, the Hawthorne, New Jersey, engineer who has been nominated for vice president of the Northeastern Area, is the staff manager of Transite Pressure, Irrigation and Sewer Pipe in the Transite Pipe Department, Division Headquarters, Johns-Manville Sales Corporation. He joined the Johns-Manville firm in 1937, following 18 years in the construction and engineering field, specializing in the construction of water supply and sewage systems.

He is the immediate past president of the New Jersey Society of Professional Engineers, having completed his term of office on June 30, 1953, and is also past president of the Passaic County Engineering Society. He is treasurer and trustee of the North Jersey Water Conference, and he is active in the New Jersey Section of the American Water Works Association, the New Jersey Sewage and Industrial Wastes Association, and the American Public Works Association.

He received his technical education through an I.C.S. course and extension courses at Rutgers University.

M. F. WOOTEN, JR., of Charlotte, N. C., who has received the nomination for vice president of the Southeastern Area, is a graduate of the University of North Carolina at Chapel Hill. He received his B.S. in Civil Engineering in 1929 and since that time has done extensive graduate work, including a year's special course in sanitary engineering at the University of North Carolina.

M. F. Wooten, Jr.

He began his own private practice in 1939. His firm—Wooten, Wooten and Crosby, Consulting Engineers and Architects—does work throughout the Southeast, and he is registered in ten states in that area.

He was an organizer of the Professional Engineers of North Carolina and served as president in 1950. He is an NSPE national director and chairman of the Interprofessional Relations Committee. He is also a member of the Charlotte Engineers Club, American Water Works Association, and the Society of American Military Engineers, as well as the Rotary Club, the Charlotte City Club, and many other civic groups.

R. J. Rhinehart

ROBERT J. RHINEHART of Pine Bluff, Ark., nominated for Southwestern Area vice president, is a Purdue graduate, having received a B.S. in Electrical Engineering in 1922 and an E.E. degree in 1926. He is a division superintendent for the Arkansas Power & Light Company in charge of transmission and distribution systems in 52 towns.

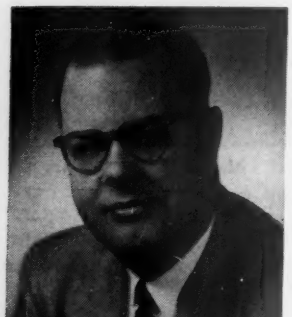
He has been an NSPE national director for the past three years and is also a member of the Compendium of Registration Laws Committee. He has been a member of the Arkansas State Registration Board for five years, and president for two. He is chairman of the Uniform Laws and Procedures Committee of the National Council of State Boards of Engineering Examiners, a past chairman of the Arkansas Section of the American Institute of Electrical Engineers, a charter member of the Kiwanis Club of Pine Bluff, and a past chairman of both the Pine Bluff Planning Commission and Park Commission.

Orland C. Mayer

ORLAND C. MAYER of Boise, Idaho, nominated again for the vice presidency of the Western Area, is a native of Mora, Minnesota. He received his engineering education at the University of Idaho, graduating with a B.S. in Electrical Engineering. He is now director of industrial development in charge of industrial engineering work for the Idaho Power Company in Boise.

He has served as a national director from Idaho and is a past president of the Idaho Society of Professional Engineers. In addition to holding the Western Area vice presidency for the present administrative term, he is also chairman of NSPE's Registration Committee.

He is a member of the Idaho State Board of Engineering Examiners, the Boise Chamber of Commerce, and other civic and fraternal groups.



John B. Jardine

JOHN B. JARDINE of Fargo, North Dakota, the nominee for vice president of the North Central Area, is a graduate of the University of North Dakota, from which he received a B.S. in Civil Engineering in 1937, and has also done graduate work in concrete design at Cornell University.

He is president of the Concrete Sectional Culvert Company and vice president and general manager of the Jardine Bridge Company, Inc., having been associated with both firms in various capacities since 1938.

He is a past president of the North Dakota Society of Professional Engineers from which he also served as a national director for three years. He is vice chairman of the North Dakota Board of Registration for Professional Engineers and past president of the Fargo Engineers Club.

Mr. Jardine belongs to the National Concrete Masonry Association, is a former director of the Concrete Pipe Association, and is a prominent member of the National Association of Manufacturers. He is a current nominee for director of the latter organization. In addition, he is active in civic societies and fraternal groups.

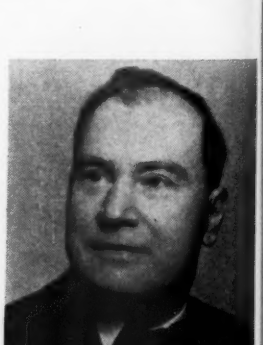
Virgil E. Gunlock

VIRGIL E. GUNLOCK, nominee for vice president of the Central Area, is Commissioner of Public Works of the City of Chicago. He is a graduate of the University of Illinois, having earned his B.S. in Civil Engineering in 1927 with high scholastic honors.

His first practical engineering experience was gained as a structural designer with an Oklahoma City firm. A short time later he moved to Chicago where he has since been associated with the city's engineering activities in various capacities—as an engineer with the Sanitary District, working on tunnels, bridges, and treatment works; resident engineer under the city's initial subway construction contract; chief subway engineer; and chairman of the Street Traffic Commission.

He also served as chairman of Mayor Kennelly's committee to reorganize city departments, and he is deputy director of the Chicago Civil Defense Corps and a member of the Chicago Plan Commission and the Engineering Board of Review.

He is a member of NSPE's National Affairs Committee and belongs to the Illinois SPE, the Western Society of Engineers, the American Public Works Association, the American Concrete Institute, and the American Society of Testing Materials. He is also active in community affairs.

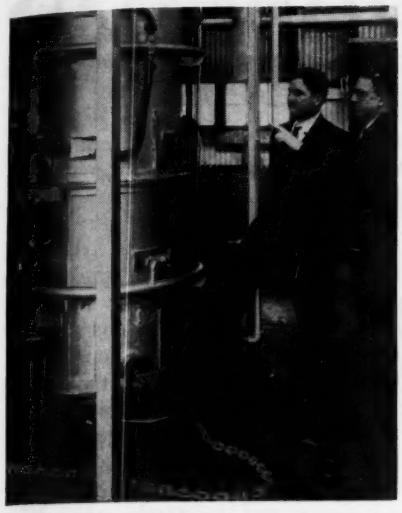


Russell B. Allen

RUSSELL B. ALLEN, nominated for a seventh term as treasurer, spent his early years in New Haven, Connecticut, and received his B.S. in Civil Engineering from Yale in 1923. After teaching at Yale, he spent several years with the Boston & Maine Railroad as a construction engineer and two years in private consulting practice. His association with the University of Maryland began in 1933, and he was given the title of full professor in 1945.

Registered in both Maryland and Connecticut, he has been active in the affairs of the Maryland SPE, having served as secretary-treasurer, as president, and as a national director to NSPE.

He is a member of Tau Beta Pi, Sigma Xi, Omicron Delta Kappa, and several other engineering societies, including the American Society for Engineering Education.



James W. Dickey, executive vice-president of Round Chain Companies, inspects the new continuous furnace while E. H. Cummings, chief engineer, points out a feature.

Continuous Chain Making

Here is another example of the ingenuity of American manufacturers in struggling against war-time handicaps and emerging, not only victorious, but with a better product as well.

Like others in the industry, The Cleveland Chain & Mfg. Co., one of the nationwide group of Round Chain Companies, found itself unable to get the same alloy steel which had long been used in making the highest grade welded chain. The government imposed restrictions on certain alloying elements.

The question then was: How can we maintain the strength of Vulc-Alloy chain, in view of the modified steel now available? Metallurgists at Cleveland Chain found the answer in an improved method of heat treating.

The old method was to pile up 50 to 100 feet of chain in the furnace and wait for the heat to penetrate this mass of steel. Success depended on the skill of the operator.

Now the chain company uses a unique, continuous, automatic heat treating furnace which overcomes the deficiencies of old-fashioned "batch" type furnaces. Chain passes through the furnace in a continuous flow. The gas burners are regulated by the latest type of automatic controls, to produce maximum tensile strength and hardness.

In spite of today's "leaner" steel, Round Chain Companies currently are producing Vulc-Alloy with a proof test equal to or better than standard specifications. Strategic alloying elements are reserved for national defense—and civilian users get a better piece of chain.

Improved Blasting Technique

A new blasting method which uses charges of low and of high velocity explosive in alternate holes, in conjunction with millisecond delay detonators, is available to quarry, open pit and strip mine operators and construction men.

Tested in the quarry field, the new method has often resulted in more breakage per pound of explosive, together with better control of throw. Need for secondary blasting has been diminished and in some cases practically eliminated. The new system is termed "alternate velocity loading" by the Atlas Powder Company which developed it.

In practice, the rock is placed under a powerful twisting stress by the initial discharge of a low velocity explosive. High velocity explosive, detonated a small fraction of a second later, hits the fully stressed rock at the moment when maximum shattering action can be obtained. As in the past, millisecond delay detonators are used with the two types of charge, and contribute to the total performance.

Economy is maintained by the use of low-cost ammonium nitrate explosive which is made to perform as low, medium or high velocity explosive by the insertion during manufacture of a core of ammonia gelatin.

Technical information on the application of this new development is available from the Technical Division, Explosives Department, Atlas Powder Company, Wilmington 99, Del.

Horse Head Bulletin

Several processes are discussed briefly in this bulletin.

The diamond drill has been an extremely useful tool in the hands of geologists in their search for new zinc ore deposits in this country and Canada. The part it is playing in exploration is told in the feature story.

Another story reports on plans for the sinking of a shaft at a new mine property in eastern Tennessee.

This issue also tells how a fume collection installation at a smelting plant is recovering metal values heretofore lost to the atmosphere.

Write: New Jersey Zinc Company, 160 Front St., New York 38, N. Y.

. . . say you saw it in the AMERICAN ENGINEER.

Gas Turbine Auxiliary Units

The development of two new models of lightweight gas turbine auxiliary power units by AiResearch Manufacturing Company, Los Angeles, was recently disclosed by Homer J. Wood, AiResearch's Assistant Chief Engineer.

One of the gas turbines is a compressed air supply unit with a weight of 170 pounds and an output rating of roughly the equivalent of 170 horsepower. The other is a combination compressor and shaft power unit from which both types of power can be extracted simultaneously. It is in the 120 horsepower class.

Wood said that the salient feature of the new gas turbines is the complete enclosure of the hot parts of the turbine and nozzle box in a pressurized chamber. This "cool skin" feature eliminates a design problem found in earlier model gas turbines and represents a major step in improved fire safety.

For example, he said, if the outer skin of the gas turbine is pierced by a projectile or cracks due to vibration, the leakage consists of compressed air at the heat of compression rather than hot gases at combustion temperatures as would be the case with older designs.

Although design of the new gas turbines has been simplified by the elimination of stainless steel and aluminum enclosures, they remain fully automatic self-contained units and in their workings are closely similar to units now in production.

Wood said that elimination of the metal envelopes on the new machines not only meant a saving in weight, but increased the machines' versatility of installation in aircraft. Simplification of the enclosure has the further value of reducing operational difficulties stemming from vapor lock and makes for greater ease of maintenance.

Wood expressed the belief "that it is a fair statement to say that the gas turbine has 'come of age' as an aircraft auxiliary power plant for applications of from 50 to 500 horsepower.

"It is understood, however, that this type of auxiliary service is primarily for making the airplane self-contained by providing power on the ground when the main engines are inoperative or for relatively short portions of the flight plan which render the fuel consumption issue of secondary importance."

PATENT FUNDAMENTALS FOR ENGINEERS

—Part III of III Parts—

BY HENRY K. LEONARD, *Patent Attorney,*
Law Offices, Owen and Owen, Toledo, O.

As a final example of claims and infringements, let's suppose that Mr. K. invents a quadruped—a four-footed animal. So he files a patent application on the quadruped he invented. Incidentally, the one which he thought of happens to be a riding horse, and it has two white forefeet and a black mane and its left eye has a cast. That happens to be the quadruped that he thought of but that is immaterial because nobody else ever thought of quadrupeds at all; so he is entitled to a patent claim reading, "A quadruped."

So then you invent a cow, and you find Mr. K.'s patent in the Patent Office and you realize you can't make your cow because the quadruped patent covers the cow. Your cow is a quadruped and as such, it infringes the broad K patent. Someone else comes along and invents a horse with the same white forefeet as Mr. K.'s and the same black mane, but the right eye has a cast instead of the left eye. He can't make his horse either; he can't practice his invention, because Mr. K.'s patent dominates the quadruped field. Your invention may be an improvement in the quadruped field. The cow is obviously an improvement over the horse, and it may even be an improvement to have a cast in the right eye, but still neither you nor he can manufacture because the broad quadruped patent dominates the field.

Now assume that instead of having a claim reading "A quadruped," Mr. K.'s patent has a claim which reads like this, "A four-footed animal suitable for transporting human beings, said animal having two white forefeet and a black mane." (We'll leave out all the rest of the details because they aren't necessary.) The man with a cow comes along and he finds Mr. K.'s patent. Sure, it was the first patent to show a quadruped, but it claimed only a specific quadruped having two white forefeet and a black mane, and a cow doesn't have a black mane. Obviously Mr. K.'s patent doesn't cover the cow, and so the man who invented the cow can make his cow himself; and he can prevent others from making his cow including Mr. K., which is more important.

Now assume that Mr. K.'s claim even went so far as to recite the cast in the eye. If it did, the man who invented the horse with the same colored forefeet, the same colored mane, but a cast in the *right* eye, would infringe Mr. K.'s claim only if Mr. K. said "One of the eyes having a cast," because that doesn't specify which eye has the cast in it. But if Mr. K. said, "The left eye having a cast," and the two were not mere equivalents, then the second horse would not infringe the claim in Mr. K.'s patent.

Of course whether or not you can get a patent on your cow, or the other fellow can patent his horse having a cast in the right eye depends on whether or not they are patentable improvements and not on the question of whether or not they infringe Mr. K.'s claim. And if you do get a patent on the cow, even though it infringes Mr. K.'s quadruped claim, Mr. K. can't make, use, or sell cows either.

I'm going to give away trade secrets here and I really ought not to do it. The way you determine whether or not you're infringing somebody's patent is this. You stand in front of an embodiment of your invention, or your device, or whatever your company is going to put on the market tomorrow morning and you look at it. You pick up the other fellow's patent and you start reading the claims. Each time you find something in the claim you look for it on your device and if it's there, it's all right unless *everything* you find in the claim is there; and if everything the claim lists is in your machine, you infringe a claim on its face. Now don't quit there because lots of times your patent lawyers have ways of proving that what the claim says isn't really what it means at all. Besides even if it does mean what it says, the patentee couldn't have it in the first place; and in the second place if he could have it, it's invalid anyhow for other reasons. No; don't quit there, but that's a good time to call up your patent lawyer.

THE distinction between claims is one thing that bothers some of my engineer friends. They read a set of claims and it seems that all the claims say the same thing. If you compare the claims word for word though, they don't say the same thing. You can't get two claims that describe the same thing precisely. You will find that a word has been changed, or maybe two words, or maybe ten, but at least there are some words different. That one word may be a verbal change from the border of claim 1 in *Figure One* to the edge of claim 2, drawing in your horns a little bit. Or it may be a change in the other direction from claim 9 to claim 6, for example, stretching out a little in one direction. The only way you can determine what the variation is, is by analyzing precisely what the changed word means, and the word that it modifies, and

Correction

In the October issue Mr. Leonard's article pointed out that if a Patent Office examiner did not know about a commercial practice which had not been patented, he would not refuse a patent covering it. The article suggested that where a person did not desire to patent his own development he might, therefore, prevent the inadvertent issuance of a patent covering it, for example to a competitor, by sending the information to the Patent Office.

The Patent Office points out that there is no regular system for such disclosures and that it is not a repository for such material. Such information should not be merely sent to the Patent Office but, where such a step is contemplated, the material MUST be in the form of a printed publication. It may then be transmitted to the Patent Office, addressed to the Commissioner of Patents for the attention of the examiner handling the art to which the material relates. The material should be in the form of a catalog, operating manual, book of processes or similar form.

you'll find a change, at least a little change, in the area covered by the claim.

You may infringe one claim of a patent and not infringe any of the rest of them because your invention may fall right in the area between the edges of claims 2 and 1. So, if your patent lawyer can determine that the outside claim, number 1, is invalid (and many times the patent lawyer can be quite certain about that), then you can go right ahead and manufacture this device that lies out there, because you're outside valid claims 2-9 and you don't have to worry. So each of those little words is extremely important and you can't be safe by thinking that all of the claims cover the same thing, or by not doing what it shows in the drawing.

I mentioned earlier that the word "utility" in the patent law means "utility of purpose" and not a "utility of means." There is a saying, we all know, that the way to make a lot of money is to "build a better mousetrap and the world will beat a path to your door." Utility has nothing to do with what you and I think of a thing. It is necessary to know your subject matter. It is necessary to create an improvement over what has been known previously. And once you have done that, you are in a position to proceed with the filing of a patent application.

But invention, incidentally, isn't limited to mechanics. It isn't limited to mechanical fields or other industrial fields. Many great inventions have been made in the medical field, for example; some of the most famous are insulin and the new antibiotics—great inventions and patentable inventions.

But to come back to the engineer—where do patents particularly fit into engineering work?

There are several kinds of patents that fit into your work; first, your own. Your own patents are one of the finest ways of establishing a mark in your profession. One of the best measurements to patent lawyers (and we know, for executives in industry, for example) of engineers and their work is what they have done in the patent field—particularly so in some fields. The progress of a man like Kettering is measured to a large extent by his inventions. And as he produced them and as they were patented, it enabled the people with whom he was working to progress in their field; and so Kettering progressed, and so other inventors have progressed. Now if you happen to be a civil engineer and you build bridges, you're not very interested in patents; but most of us are not civil engineers.

SECOND, patents in general.—Remember I stated there were two and a half million of them. They are perhaps the greatest source of "know-how" which is available. The study of the patents which have been classified into your field of endeavor will give you a picture of what has been done in that field more rapidly and more completely, perhaps, than anywhere else.

Third, your competitor's patents.—You know you don't want to infringe them, so you must know something of patents to avoid that. Some of the finest inventions which have come along in recent years have resulted from just that—the avoidance of competitor's patents. If the competitor has a patent on a device which does the job which you're trying to do, and if you have to exercise your ingenuity to solve that problem in a manner which will avoid his patent, many times the solution with which you come up not only avoids his patent, but also is an invention itself, and frequently is much better. Industrial history reveals instance after instance where the second man produced a really worthwhile thing because he avoided the first man's patent, and made a better one.

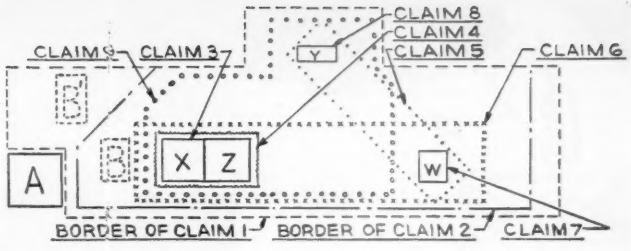


Fig. 1.

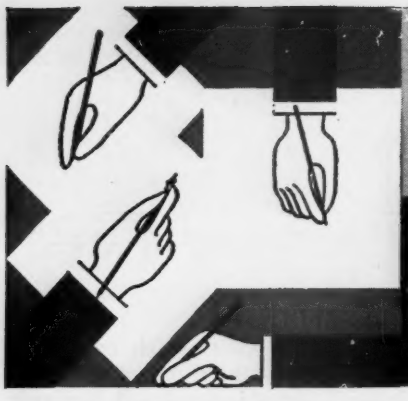
I will very briefly discuss a point which comes up very frequently in the patent field—the rights of inventors in their inventions. If an inventor is employed to invent (and many engineers fit into that category), his inventions are without doubt the property of his employer. That's the reason why he is employed. Many companies have a more generous approach to that problem and also reward the inventor who is employed to invent, if his inventions are commercially successful. But the law does not require it.

If the engineer or inventor is employed, for example, in a position where the facilities and the training which he receives in his position are important to his invention, but where he's not employed to invent; if the invention is made on company time, and using company equipment and material or the services of machinery in the company shop or other company facilities, the invention usually belongs to the company. If the invention is in the company's line, it almost always belongs to the company. If it is outside of the company's line, entirely different, even though invented on company time, even though invented on things the company uses, etc., the answer depends on many facts; but at least the company has what we call a "shop right" and that amounts to a non-exclusive license under the invention. Its contribution has been the facilities, the work of other people, the additional training, etc. for the production of the invention and, of course, in addition, the engineer's salary.

IF one is employed as an engineer, and if the invention is made in his basement, on his own time, using his own equipment, using no company facilities, no company employee's time, material or anything else, it's totally his own invention. If it's in his company's field, they will be quite hurt with him if he doesn't give them first crack at it, I feel sure. In fact they may be hurt with the engineer if he doesn't make them a present of it. But that's a problem for the inventor and the executives to work out and the law isn't going to enter into it. In general, if it was made in your basement and on your own time, and if it is your own idea, and has no connection whatsoever with whatever your employer has furnished you, it's yours.

Most companies who employ engineers ask them to sign employment contracts and those employment contracts contain clauses pertaining to inventions. Some inventors object to signing them. There's a twofold purpose for such contracts. One thing is to definitely set up ahead of time, before there is any argument about it, whether or not an invention is yours or the company's; to definitely establish whether or not it's going to be, because it is much better to get the contract agreed upon ahead of time than it is to wait until a controversy comes up and then try to settle it. Later it's unpleasant, and ahead of time it's much less trouble. Secondly, such contracts are signed to avoid the question, where the law has to examine a thousand

(*Continued on page* 49)



Professional POSTSCRIPTS

Even several weeks before Christmas, the AE's mailbag strains the good nature of the carrier. More and more readers send —PP— "bit and pieces" of things they read and hear about. Or, if the spirit moves them, they put pen to paper and come forth with some thoughtful gems of their own. By the way, isn't it about time we heard from you?

First off this month is an item from the intra-company magazine of General Electric's, *The Monogram*. It's encouraging don't you think?

—PP—

Quite a few people recently have been taking an interest in technical men. Press and magazine writers discourse variously on how to get more of them and how to make better use of the ones we have. I sometimes wonder what they think of engineers, and what their reading public thinks of engineers . . .

Around the turn of the century . . . magazine advertising also pictured a big man in battered felt hat, short leather jacket and knee-high laced boots, peering intently through a telescope on a tripod at the Rocky Mountains, with maybe a deep, rocky gorge spanned by the girders of a bridge in the background. Man pushes back the frontier—the engineer!

Sometime about the '20's the engineer was one of a group of men gathered around a desk or table littered with blueprints. You could tell which man was the engineer —he was the one in shirtsleeves, wearing an eyeshade, and pointing at a drawing in an attitude of requesting approval. He had now learned to draw pictures.

It was about this time, too, that he began to appear in a white coat, looking at or tinkering with a small piece of machinery. Sometimes he was looking up at a test tube of colored liquid held in one outstretched hand—then he was a *chemical* engineer. There was a similarity between these pictures and others in the magazines of the dignified and reassuring gentleman with glasses on a string and a microscope somewhere around, who was of course a doctor of medicine. Here was an inference that engineering was becoming an intellectual profession.

Pretty soon the engineer moved up in the world. Now he is seated *behind* the office desk, dressed in a Hickey-Freeman suit, while through the large window behind him may be seen the bizarre shapes of a complicated factory. You can tell he's an engineer because there's a slide rule on the desk, and the implication is that he knows higher mathematics and is responsible for a large factory operation.

And now we have the most recent picture—a bushy-haired individual seated at a bare desk, staring enigmatically through heavy-rimmed glasses straight into the camera lens, backed by a large and incomprehensible chart of the isotopes. The man of classified mystery!

Inaccurate and exaggerated as these pictures may be, they do represent the gradual public recognition of the advancement of the profession. The clear implication is that the public expects the engineer to be a *professional* man, an *educated* man, not merely a *trained* man. They expect him to take a leader's position in the professional and economic life of the nation. The responsibility for the effects of his works on people is being thrust back upon him.

Do You Have Some Thoughts on the Problems of the Profession? Why Not Write Something for —PP—?

—PP—

It isn't often that engineering and advertising people have much in common, but our attention has been called to a piece in *The Advertiser's Digest* that should interest AE readers. This short story is called "Engineering Economics" and is written by William L. Swager, Supervisor, Operations Division, Battelle Memorial Institute.

—PP—

The rapid pace of science and technology has made it difficult for the businessman to interpret for himself the significance of the many developments coming to his attention daily. In recent years, this pace has been astounding.

Businessmen need to know what these developments mean in terms of markets, dollars and profits. Research men need to know a bit of economics so that their research results will be practical.

Because of these needs, a field of effort has grown which can be termed *engineering economics*. It also may be known as techno-economic studies or technical and economic surveys. Regardless of where the work is done or what it is called, the studies conducted are aimed at bridging the gap of knowledge between technology and business, finance and economics.

In that sense, engineering economics can be likened to one span of a bridge having its foundation in technology. Workers in engineering are well founded in science and engineering with additional training in business and economics. They are attempting to interpret for the businessman the action and reaction of technology and business.

The other span of the bridge might be considered business economics, having its foundation in business and finance. At some point the two spans meet. In many cases, investigators in the two fields are working toward the same answers from different points of view.

Engineering economics is considered to cover three major fields: research guidance, operations guidance and the guidance of capital. Studies in these fields are made for management. They serve a staff function and provide information in the form of concise reports upon which management can base its decisions.

Constant thought must be given to economic as well as technical factors so that, as a result of research, the client may be warned against economically unsound attempts at manufacturing and marketing certain products.

Studies in engineering economics are an invaluable tool for the industrial research executive. A research department's success is measured by the number of new products and profits realized by the company through research results.

These studies allow the research director, at several stages of planning and development, to screen out of the many ideas that come to his attention those having a reasonably good chance to become profitable ventures for his company.

These studies provide him with estimates of processing costs, information on the availability and cost of raw materials, data on the size and location of markets, and the relative advantages of various plant locations. Using this information, he is in a position to eliminate at early stages the less promising projects, thereby boosting the "batting average" of his department's research efforts.

During World War II, scientific methods for analyzing military operations were developed. The techniques that were used allowed the military to make optimum use of available equipment, weapons and manpower.

Since the scientific method was applied to fields outside those conventionally considered as exact sciences, a new term, "operations research," was coined to describe such activities.

Today, the techniques of operations research are being applied to commercial operations as well.

The usefulness of operations research technique to complex business problems is apparent if one considers how many present-day business factors are stated in terms

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of probabilities, and how many business factors are intangible.

Operations research provides a method for measuring many of the previously considered intangibles. It provides a means of relating the cause-and-effect factors so that the business executive can see clearly the inner workings of his business in a way he hadn't considered before.

In one sense, operations research can be thought of as a method for diagnosing business operations. With the diagnosis in hand, the executive can decide on remedial action.

More and more industrial firms are coming to the realization that a broad base of earnings is a hedge against business cycles and loss of markets caused by changes in technology. Many companies that have made excellent records in the production and sale of a few products are choosing to expand by exploiting their knowledge and position not only in their present fields, but in those closely allied. Others are choosing to invest in new plants or going concerns in fields entirely foreign to their previous experience . . .

But today, with the increasing complexity of technology and the increasing applications of technology in everyday business affairs, businessmen are calling for engineering economic studies by a balanced team of engineers, scientists and engineering economists to provide basic data for sound business decisions.

—PP—

Finally this month we are pleased to welcome to our pages Engineer W. L. Ducker of the Department of Petroleum Engineering, Texas Technological College at Lubbock. This article, "The Cross-Roads of Engineering Education" is important to all of us. Don't fail to read it now.

—PP—

There is room for some diversity of opinion on the question of how the universities and colleges are to solve their problem of getting, and keeping, competent engineering faculty in the face of industry's current salary schedules for engineers of similar qualifications.

There seems to be ample evidence to support the proposition that the current engineering salary and demand situation, which is the focal point to the general problem, *is not* merely a collateral effect of the present industrial pace resulting from the post-war inflation, but that it rather marks the coming of age of the engineering profession.

It cannot be argued but that World War II, with its tremendous demands for technical creating under the handicap of acute manpower shortages did bring about, or probably more correctly hastened the coming of, a more or less complete understanding by industry of its dependence on engineering; and that this situation is temporary is a view that will not survive scrutiny. One may well doubt that we will ever again return to the days when no effort was to be spared in keeping a good foreman, but the chief engineer—well the foremen could collectively do almost everything he did; when the man in charge of engineering development punched the time clock along with the other shop employees, or when a $400 a month engineer was charged with the responsibility for the design of the products or services on which the company depended for its successful place in its competitive field.

World War II and inflation have not created a set of unique conditions in which engineering occupies a peculiarly but temporarily vital place; they have rather created a set of conditions that have revealed, in unmistakable terms, that engineering is essentially and inherently vital to our economic system. There is nothing new about the nature of engineering; the newness is in the widespread and growing realization of the nature of engineering, and this trend cannot be expected to reverse.

Thus today the realization is growing that engineering is as necessary to the economy of the country as medicine is to the health, or as law is to the government of the country; and as a result of this awakening, engineering is moving into an income bracket that is commensurate with its responsibilities, and that is comparable to that of its brother professions.

This has dropped with considerable impact upon the colleges the problems so well outlined by President Burdell of Cooper Union, in a recent issue of the AMERICAN ENGINEER, of how engineering schools are to get and keep competent faculty in the face of competition from an industry that offers these current salaries to engineers.

Unfortunately for those colleges and universities that have been used to supporting, and feel that it should still be possible in some way to support, an engineering program on salary appropriations similar in amount to those required for the departments of History, English or Foreign Language, the present engineering faculty problem becomes particularly acute; while with all but the largest schools, and even with those in some areas, signficant realignments of thought in regard to engineering faculty salary schedules are being forcibly imposed. The realization that engineering faculty, like those of Law and Medicine, must be paid more than the faculty of English, because engineers, like doctors and lawyers, simply make more money than do English teachers, is one of today's hard facts of life that college and university administrators find difficulty in facing, but no possibility of avoiding.

These matters are rather well recognized by the administrators of engineering programs, and the question in their minds has probably to do more with what *can* be done, than with the more obvious question of what *should* be done. And those colleges and universities that can meet the competition of the times will maintain the quality of their engineering faculty and will continue to produce graduates of good qualification, while those that are forced by meager endowments or appropriations to continue on their pre-war ratio of engineering to non-professional academic salaries will suffer a gradual but positive decline in the quality of their engineering faculty, with an inevitably resulting decline in the qualifications of their graduates, which, through the effect of industry's reluctant acceptance of them, will throw increased enrollment to the larger schools. Thus the strong will prosper and the weak will, if not die, at least shrink to a steady state of operation on a purely local neighborhood basis.

This process in educational institutions, and its terminal state, are not without precedent. At the turn of the century, medicine in the United States was at its period of most virile growth, with Johns Hopkins Medical School (established in 1893) showing the way for the large medical schools that were to follow. But there were also at that same time a great number of small, mediocre schools with low-paid staffs, doing an active "business." Then came the widespread and popular appreciation of the value of modern scientific medicine, with an accompanying increase in the incomes of the doctors and an increased demand for, and increased costs of good medical education, and the good (and well endowed) medical schools prospered while the small, mediocre ones declined, until their condition became so bad that in 1910 the Flexner Report, on Medical Education in the U. S., to the Carnegie Foundation finally spelled out their death sentence.

Today engineering education is probably standing at the same cross-roads at which medical education stood early in this century, and the evolutionary processes of our economic system may be expected to operate now as they did then.

There would thus seem to be only two courses open to the administrators of engineering schools. One being to recognize that their ward has finally come of age, and arrange in some way to meet the competition of industry and maintain the quality of their faculty and prepare to move on into a rapidly expanding and changing program of engineering education that will place them in a position to meet the increased demands of industry for better engineers, and the demands of students for a more comprehensive engineering education.

The other alternate is to resist the trend and continue, as nearly as possible, in the *status quo*, suffer an inevitable decay of faculty and teaching quality, and allow their schools to descend to a position of local institutions.

Plans to borrow part-time instructors from industry, plans to supplement faculty salaries by making some of the professors' time available to industry for consultation work (they already have full time jobs), or any other plans short of a forthright advance of faculty salaries to competitive levels, evidence either a blindness to, or more forebodingly, a helplessness before, the changing environment of the times.

(EDITOR'S NOTE: *All those desiring to list their meetings under Dates to Remember should send* COMPLETE *information, including date and place, directly to the* AMERICAN ENGINEER.)

Idaho Society of Professional Engineers—Annual Meeting. January 15, 16. Boise, Idaho.

Kansas Society of Professional Engineers—Annual Meeting. January 22, 23. Topeka, Kansas.

Texas Society of Professional Engineers—Annual Meeting. January 28-30. Corpus Christi, Texas.

NSPE Spring Board Meeting—February 18-20. Hilton Hotel, Albuquerque, New Mexico.

Ohio Society of Professional Engineers—Annual Meeting. March 26, 27. Mayflower Hotel, Akron, Ohio.

We're Growing!

This issue of the AE contains 50 pages and 35,636 copies will be printed. New Records!

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Gay Social Gatherings Mark Joint Indiana SPE and NSPE Board Meeting

Sparkling social affairs for engineers and their ladies provided enjoyable entertainment at the recent Indianapolis meeting of the Indiana SPE and their guests, the Board of Directors of the NSPE.

On Friday, November 6, six regional Luncheons were held in the Severin Hotel with those men from particular areas dining together. After this affair, industry tours of outstanding firms in the area were made available for those who could attend.

Friday evening was highlighted by a buffet dinner and a square dance, while Saturday noon the group enjoyed an address by the Honorable Alex M. Clark, Mayor of Indianapolis. Members of the State Registration Board were guests at this time.

The two-day affair ended Saturday night with a refreshment hour and the Annual Banquet, both held at the Columbia Club. At the banquet Engineer Paul E. Thomas, General Superintendent of the Gary Steel Works, received the "Engineer of the Year" Award from the ISPE.

An active program was held for the ladies and included dinner on Friday evening and square dancing. On Saturday the guests enjoyed brunch, a tea and style show, and the annual banquet.

Chairman of the Ladies' Program Committee was Mrs. L. E. Easley. Other Committee heads were L. I. Couch, Program Committee, and E. G. Hinshaw, P.E., Hospitality.

Christmas Magic

The star-shaped snowflakes softly fall
To deck each bough with sparkling white.
With magic wand the stars are hung
Like jewels of celestial light.
The treetop holds, as crowning gem,
The glowing Star of Bethlehem!

Once shepherds saw the wondrous Light;
Beside a crib they knelt in prayer.
The humblest hearth now glows with Love
Because His gift — a Child — is there!
The angel voices sing again:
Peace on Earth, Good Will to Men!

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N.S.P.E. Believes

THE PROFESSIONAL ENGINEER IN INDUSTRY

BY PAUL H. ROBBINS, P.E.

Executive Director

N.S.P.E.

OVER the past several years, NSPE has been expanding its programs to be of more direct assistance to the large proportion of the engineers of the nation who are employed in industry. This is only natural, for a review of the composition of the engineering profession shows that seven out of eight professional engineers are employees, in the sense that they work for government, a corporation, or an industrial firm, and that at least three out of five of NSPE's membership are employees of industry.

Recognizing that there are certain distinct problems created because of this composition of the engineering profession, in 1951 NSPE created the Professional Engineers Conference Board for Industry for the purpose of research on some of these perplexing problems.

At the Daytona Beach meeting in June of this year, a report was presented on the professional development of engineers in industry. The discussion resulting from this presentation, and others of a similar vein, caused the Society to establish a special Committee on Engineers in Industry. This committee gave a preliminary report at the Indianapolis meeting and received the endorsement of the Board to mobilize the Society's programs behind studying and attempting to resolve some of these perplexing problems. This committee, of course, has only begun its work. One of its first jobs will be to review carefully the scope of the problem, as well as activities in which the Society is now engaged which might be adapted to be of greater assistance to engineers in industry.

The research of the Professional Engineers Conference Board for Industry, of course, offers an opportunity for study in many industrial fields, and it offers a channel through which basic information can be secured. There will be close cooperation between the Board and the new committee.

The degree to which the problems of engineers in industry may stem from economic considerations is an important phase of the position of these individuals. NSPE's current program of bi-annual salary surveys will be of considerable assistance not only to this new committee but to management and engineers alike. Thus, it will be important that the Committee on Engineers in Industry work closely with the Salary and Fee Committee of NSPE in developing the desirable economic surveys and interpretations thereof by which a complete picture of the economic status of the engineer in industry may be formed.

One of the most perplexing problems with which engineers in industry are faced at the present time is the question of collective bargaining. Close coordination of the new committee's plans with those of NSPE's Employment Practices Committee, its Legislative Committee, and several others will be directed toward this subject.

The importance of acquainting the users of engineering services, as well as the profession itself, with the problems and some of their solutions is one of the prime objectives of NSPE's public relations program. It is probable that the Committee on Industry will have a number of suggestions for the Public Relations Committee along this line.

Another perplexing question is the actual assistance which may be given by local chapters, state societies, and the National Society to individual engineers and groups of engineers in their problems. Undoubtedly, the Chapter Activities Committee will be very much interested in suggestions from the Committee on Industry on ways and means by which our local chapters can fulfill this need.

Many of the problems of the engineer in industry are not limited to the engineering profession alone; and so it will be important that NSPE's Interprofessional Relations Committee be aware of the studies and reports of the Committee on Industry in order that problems in which members of other professions are concerned may be discussed and acted upon in conjunction with the appropriate professional groups.

It can be seen that NSPE's committees and programs are already well into this field, but the advice and coordination of a committee focusing its primary attention on engineers in industry will be most helpful. It is probable that from the Committee on Industry may emerge reports, publications, recommendations, and surveys which will pull together the work of several other of NSPE's committees on this very important segment of the engineering profession—the Engineer in Industry.

This is another indication of the service which a professional society, composed of engineers from all branches of the profession and devoting its entire efforts to the non-technical development of engineering, can render in increasing the prestige of our profession.—***End.***

With Our Members . . .

Virginia Annual Meeting

NSPE President Forrest, Admiral Jelley Among Speakers at Three-Day Conference

The Fifth Annual Meeting of the Virginia SPE was held November 12-14 at the George Mason Hotel in Alexandria, Va. The Honorable Marshall S. Beverley, Mayor of Alexandria delivered a welcoming address to the VSPE members following his introduction by D. H. Pletta, Society president, at the first professional session on Friday morning, Nov. 13.

T. Carr Forrest, Jr., president of NSPE, and Rear Admiral J. F. Jelley, director of Construction for the Department of Defense, were featured speakers, the former at the Friday luncheon and the latter at the Friday evening banquet. In addition, at the regular sessions the following speeches were scheduled: *Engineering and Tomorrow's Communities* by Seward H. Mott, planning engineer; *Virginia Legislative Problems Affecting Engineers by* E. B. Boynton, chairman, VSPE Legislative Committee; *Responsibility of Professional Men in Community Affairs,* Hon. J. A. K. Donovan, Virginia State Senator; *Engineering Educational Facilities,* Dr. Martin A. Mason, dean of Engineering, George Washington University; and *Engineering Manpower Requirements,* Dr. M. H. Trytten, National Research Council.

NSPE Executive Director Paul H. Robbins reviewed National Society activities for the assembled engineers; and directors of the Virginia, West Virginia, Maryland, and District of Columbia Societies took part in a significant round-table discussion of professional problems.

There was a varied social program, starting with a smoker for the men and a "get-acquainted" meeting for the ladies on Thursday evening, Nov. 12; and the special ladies' program also included a fashion show and a sightseeing tour to Mount Vernon.

Central Ill. Chapter Honors State Presidents

Past presidents of the Illinois SPE were presented with special awards at a late fall meeting of the Central Illinois Chapter. The honorees were Alex Van Praag, Jr., Earl E. Cooper, John L. Howie, Dr. Robert E. Greenfield, Homer L. Chastain, Dr. William D. Hatfield, Andrew W. Neureuther, Junius R. Gardner. Walter G. Sherer, Howard W. Bold, John A. Askren, Dr. Herman W. Dorn, and John F. Sweetnam.

California SPE Begins Plans For Convention

The California Society of Professional Engineers' convention and trade show has been scheduled for May 27-29, 1954, at the Mark Hopkins Hotel in San Francisco; and members are already at work on plans for the meeting which is expected to attract more than 5,000 professional engineers from the western industrial regions.

Ignatius H. McCarty is 1954 convention chairman, and C. D. Allen is president of the sponsoring State Society.

"Registrants' Night" In Philadelphia

The November 5 meeting of the Philadelphia Chapter, PSPE, marked the occasion for the presentation of registration certificates to 69 new engineers and surveyors. Francis S. Friel, a member of the Pennsylvania State Registration Board and of the Philadelphia Chapter, presented the certificates and delivered a "Registrants' Night" address.

The program also included a color film dealing with the development of iron ore deposits in Venezuela.

Civil Defense Progress In Minnesota

Through conferences between John H. Swanberg, Minnesota SPE Civil Defense Committee chairman, and Col. E. B. Miller, state director of Civil Defense, a plan has been worked out under which Col. Miller and his staff will be able to present C-D facts before the various MSPE chapter meetings. Arrangements are being made to carry out the plan with the approval of MSPE President W. L. Hinderman.

D. C. Engineers Hear Two Lectures

Members of the District of Columbia Society of Professional Engineers met recently in the auditorium of the Potomac Electric Power Company Building to hear a speech on the engineering aspects of naval research by Rear Admiral Calvin M. Bolster, Chief of Naval Research, U.S.N.

Following the Admiral's talk, William Eathorne, health and safety engineer for the Bureau of Mines, spoke on and gave a series of demonstrations concerning the hazards of static electricity.

Engineers H. Harrison and Michael M. Abrams were in charge of program arrangements.

Texas P. E. Appointed To State Board

Robert E. Moore of Dallas, Texas, a prominent electrical engineer and president of the firm of Fischbach and Moore of Texas, Inc., has been appointed to the Texas Board of Registration for Professional Engineers by Governor Allan Shivers. His term of office will run for six years until September 1959.

Mr. Moore, who is a graduate of Pratt Institute, has been associated for the past thirty years with the electrification of major projects throughout the United States. He is also vice president of Fishbach and Moore, Inc., with offices in the principal industrial centers of the United States. He belongs to many engineering, civic, and fraternal organizations and is a charter member of the American Legion.

Civil Defense Talk In Kansas City, Kan.

General Charles O. Thrasher gave a talk on civil defense before the members of the Eastern Chapter, Kansas SPE, at their November 5 meeting. The event was held at Holiday House in Kansas City, Kan., with President Malcolm Steel introducing the speaker.

Movies In Knoxville

Two movies — *Gateway to the Smokies* and *Profile of Knoxville*— were featured at a recent meeting of the Knoxville Chapter. Tennessee Society of Professional Engineers. The program was arranged by R. F. Collignon, and members of the ladies' auxiliary also attended the film showing.

Important Arizona Event

The Fifth Annual Joint Meeting of Arizona Engineering Societies, sponsored by the Arizona SPE, was held November 6 and 7 in Phoenix. Participating societies included the local branches of the American Society of Civil Engineers, American Institute of Electrical Engineers, American Association of Engineers, American Society of Mechanical Engineers, Illuminating Engineers Society, Institute of Radio Engineers, and the American Society of Metals, as well as the ASPE.

Each group arranged its own business, professional, or technical sessions, and all joined forces for the Annual Engineers Dinner, held Friday evening, November 6, in the Corral Room of the Hotel Westward Ho. Governor Howard Pyle and Frank G. Murphy, vice chairman of the Phoenix City Council, were special guests for the occasion. J. C. Lincoln, inventor and founder of the Lincoln Electric Co., was the featured speaker.

The social highlight of the November 7 program was the Annual Engineers Western Party at Bud Brown's Barn.

Carll C. Huskison was chairman in charge of the dinner, while Walter A. Burg handled arrangements for the Western party.

G. E. Moore Lecture Scheduled in Baltimore

G. E. Moore of the Westinghouse Electric Corp., from Wilkinsburg, Pa., will be the featured speaker at the December 8 meeting of the Maryland Society of Professional Engineers. Mr. Moore, who holds B.S. and M.S. degrees in electrical engineering from the University of Pittsburgh, has chosen as his topic *The Professional Engineer—A Businessman.*

The meeting will be held at the Park Plaza Hotel in Baltimore.

Franklin County Chapter Holds Dinner Dance

The Annual Dinner Dance, sponsored by the Franklin County Chapter of the Ohio SPE, was held recently in the Main Ballroom of the Seneca Hotel in Columbus. Dancing and entertainment were preceded by a full-course turkey dinner.

The November 24 meeting of the chapter featured the presentation of registration certificates to new P.E.'s in the area.

Shoch Is Speaker At Massachusetts Meeting

NSPE Vice President Clarence T. Shoch was the featured speaker at a recent meeting of the North Shore Chapter, Massachusetts SPE. Mr. Shoch's subject was *The Professional Union—A Contradiction.*

The meeting was held at the new Measurements Laboratory Auditorium of the General Electric Company in Lynn, Mass. C. B. Fontaine is president of the North Shore Chapter.

Business Lecture In Syracuse, N. Y.

Members of the Central New York Chapter, NYSSPE, meeting at the Syracuse Museum of Fine Arts on November 10, heard J. M. Simpson lecture on *How Our Business System Operates.* Mr. Simpson is a graduate of Syracuse University and is presently manager of employee relations for the Components Department of the General Electric Company in Syracuse.

Monmouth-Ocean P.E.'s Hear Highway Talk

Members of the Monmouth-Ocean Society of Professional Engineers, New Jersey SPE, heard Paul Heyniger of Sea Girt discuss the Garden State Parkway at a recent meeting held in the American Hotel in Freehold. The lecture was supplemented by the showing of slides.

P.E.'s Inspect Conemaugh Reservoir

Members of the Westmoreland County Chapter, Pennsylvania SPE, recently participated in a joint meeting with members of the Pittsburgh Post of the Society of American Military Engineers. The meeting began with a luncheon at the William Penn Tavern, during which E. M. Thompson, resident engineer for the Conemaugh Reservoir, and Jacque Minotte, chief of the Construction Division, Pittsburgh District, U. S. Army Corps of Engineers, spoke on the Conemaugh Dam which the assembled engineers where scheduled to visit and inspect later in the afternoon.

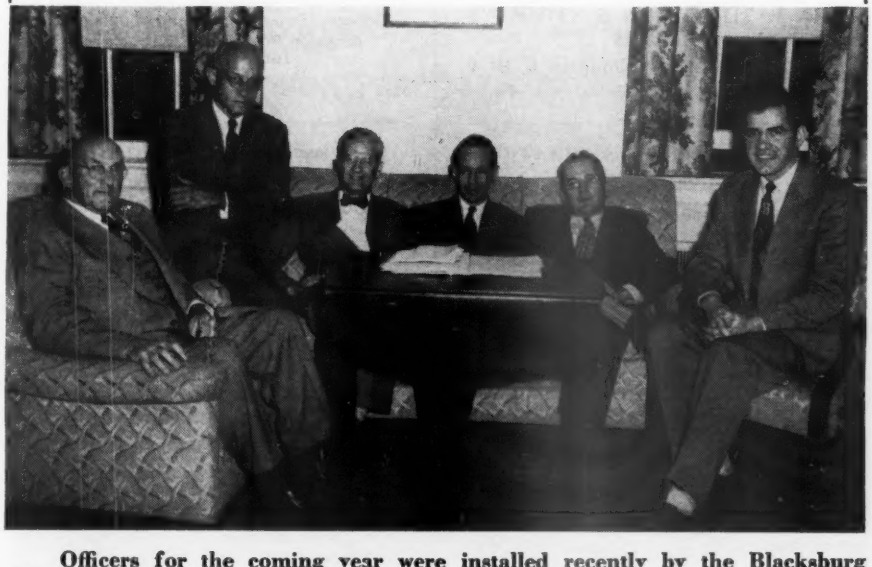
C. Edward Long is president of the Westmoreland County Chapter, and Col. William A. Conwell, who is also a member of the PSPE, is president of the S.A.M.E. Pittsburgh Post.

Savannah Chapter Elects New Officers

New officers for the 1953-54 administrative term have recently been elected by the Savannah Chapter, Georgia SPE. They are: Floyd H. Elsom, president; John M. Parr, vice president; Robert A. Jewell, secretary; Daniel E. Sewell, treasurer; George R. Terry, state director; and Joseph Hutton, Louis C. Roesel, John F. Inglesby, and M. T. McKenzie, chapter directors.

. . . more news on page 39

New P.E. Officials in Blacksburg, Va.



Officers for the coming year were installed recently by the Blacksburg Chapter, Virginia SPE. They are, l. to r.: William H. Fitzpatrick, director; P. B. Potter, director; Carl R. Delagrange, first vice president; John F. Poulton, president; James H. Lillard, second vice president; and James H. Sword, secretary-treasurer. Mr. Poulton, the new president, is an associate professor of architecture at the Virginia Polytechnic Institute.

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Directory Continued on Next Page . . .

Certificate Presentation In Cleveland

One hundred twenty engineers, who recently passed the Ohio examination, were presented with their certificates of registration at November 10 ceremonies sponsored by the Cleveland SPE in the Cleveland Engineering Society Auditorium.

Judge Arthur H. Day of the Cuyahoga County Common Pleas Court administered the Professional Engineers' Oath; and B. G. Keating of Toledo, chairman of the State Board of Registration, presented the certificates.

A November 19 smoker and social evening was also on the month's program schedule for the group.

Bergen County P.E.'s Initiate Scholarship

At a recent meeting of the Bergen County Chapter, New Jersey SPE, members voted to sponsor a chapter scholarship fund, under which the first award will be made in June 1954. The meeting was held at the Kerr Concrete Pipe Company, with company officials acting as dinner hosts.

State Senator Porter Addresses Topeka P.E.'s

Senator James Porter, member of the State Office Building Commission and a prominent Topeka attorney, was guest speaker at a recent meeting of the Topeka SPE. The event was held at the Jayhawk Hotel.

. . . more news on page 41

SMOG PANELISTS—Seated, l. to r., looking over a report on the smog problem, are the four participants in a recent panel discussion sponsored by the Pasadena Chapter, California SPE: Dr. A. M. Zarem, Stanford Research Institute; Gorden Larson, director, Los Angeles County Air Pollution Control District; Dr. Arie Haagen-Smit, California Tech chemist; and Clarence A. Winder, Pasadena's engineer-mayor. Standing, l. to r., are: Arthur C. MacMillan, chapter president; Attorney John H. Rice, panel moderator; and Edward G. Lowell, chapter program chairman.

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Review Course In Sharon, Pa.

The Midwestern Chapter of the Pennsylvania SPE, working with Pennsylvania State College, is currently sponsoring an engineering review course for electrical engineers at the Sharon Senior High School in Sharon, Pa. Gerald Hattrup of Sharpsville, Pa., is conducting the course which will cover 64 instruction hours.

Capital Chapter, Ill. SPE, Honors Past Presidents

At a recent dinner meeting at the Hotel Leland in Springfield, Ill., members of the Capital Chapter paid tribute to the group's past presidents. Special certificates in recognition of their service were presented to the honorees who included: C. M. Slaymaker, L. A. Wilson, W. H. Wisely, W. B. Worsham, H. A. Spafford, S. T. Anderson, T. C. Coe, T. L. Flatt, H. D. Hill, C. T. Morrisett, S. J. Sibley, R. S. Nelle, A. M. Frost, J. P. Murphy, LeV. D. Hudson, and L. F. Ryburn.

State Society officers were also invited to be present for the occasion.

Claude P. Owens Dies

Claude P. Owens, prominent member of the Alabama SPE and director of the Division of Food and Milk Sanitation, Alabama Department of Health, died as a result of a heart attack early last month. Mr. Owens was president of the Montgomery Chapter, Alabama SPE, and was a nominee for first vice president of the State Society. He is survived by his wife, Mrs. Mary Forte Owens, and a daughter, Judy.

With the Ladies

By MRS. FRANK W. CHAPPELL

Chairman, NSPE Ladies Advisory Committee

A Ladies' Auxiliary to the Beaver County Chapter, Pennsylvania SPE, has recently been organized. Mrs. Joseph F. Reis of Aliquippa is president of the group. Other officers include: Mrs. Carleton C. Long, first vice president; Mrs. Charles R. Day, second vice president; Mrs. P. Herbert Loedding, third vice president; Mrs. Christy Hallien, recording secretary; Mrs. Henry E. Klugh, Jr., corresponding secretary; and Mrs. George Van Maldeghem, treasurer. Auxiliary directors are Mrs. John Merriman, Mrs. George T. Brunn, Mrs. John L. Skeehan, and Mrs. Lloyd M. Shenefelt.

An advisory committee for the Auxiliary was named by James Baker, Beaver County president. Its members are Gibson Brock, Miss Jo Godley, and Mr. Van Maldeghem.

The Ladies' Auxiliary to the Tulsa Chapter, Oklahoma SPE, sponsored a pot luck dinner recently for chapter and auxiliary members. Mrs. Glynn C. Dehaas was chairman in charge of the dinner arrangements, assisted by co-chairman Mrs. B. B. Murphy.

What's New

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A new Laboratory Dry Blender, designed for research and development of a wide range of blending problems, has been introduced by The Patterson Foundry and Machine Company.

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POWER STEERING AID — Item 2

A new control valve that permits truck operators to select the degree of steering assist, at the flick of a finger, when connected with the Air-O-Matic Power Steer Booster, has been announced by Air-O-Matic Power Steer Corporation. Immediate command of steering assistance under all driving or road conditions, in traffic or in maneuvering in and out of loading dock locations is easier.

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A new line of miniature Side Indicating Panel Meters has been announced by International Instruments, Inc. Developed to obtain greater legibility for complex instrument panels, these meters provide maximum scale length with minimum panel area. These self-contained units can be grouped in both horizontal and vertical arrangements implementing at-a-glance comparative readings while reducing the size and weight of equipment. Available in zero center, left and right models.

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Among the specific applications of the new transducers are total-hemispheric and net-exchange radiometers, portable heat-flow meters, and soil heat-flow recorders.

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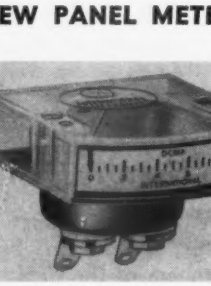

NEW PLIERS — Item 5

Six new PROTO pliers—a multi-purpose compound leverage type (No. 234), a multiple-groove joint type (No. 243), a midget diagonal (No. 204), and three needle nose styles, long thin needle nose (No. 222), curved thin needle nose (No. 225), and long reach short jaw needle nose (No. 228), —have been announced by Plomb Tool Company.

This column describes new products of general interest to professional engineers. For further information, fill in the coupon provided and mail to the AMERICAN ENGINEER.

PHOTOCOPYING — *Item 6*

Photorapid is a new one-unit (printer and developer combined) photocopy machine. Measures 16½" x 23½" overall, with developer tray removable for cleaning. Non-metallic construction prevents corrosion.

Produces exact, letter perfect copies—whether the original is single or double sided, opaque or translucent, white or colored. It makes single side copies, double side, transparent copies for use as masters with diazo or blueprints, tissue copies for air mail.

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COUNTER-RUST COATING — *Item 7*

After over two years of intensive laboratory research, Adelphi Paint & Color Works, Inc. announces a completely new and effective weapon in the fight against corrosion — Adelphi One-Coat Counter-Rust. It is easily applied on any steel structure over any film of paint in fair to good condition.

One coat of Counter-Rust is said to equal three coats of commercial rust inhibitive paint in film thickness. Solvents have been practically eliminated in the formulation to prevent the forming of pinholes due to evaporation. Counter-Rust is pigmented with a carefully blended pigment combination to provide for anti-corrosive chemical reaction within the paint film.

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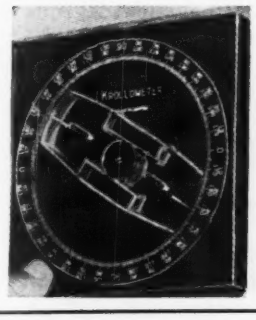
THE KROLLOMETER — *Item 8*

A precision-made instrument that knows all the angles . . . the "Krollometer" . . . has been designed to be a worthwhile addition to equipment of construction engineers, surveyors, home workshop owners, electricians, concrete workers, and others. Movable dial face shows all angles in degrees on one side. Reverse side translates degrees to inches per foot drop, carpenter square measurements and percentages of grade. A time saver for figuring roof framing, leveling floors and foundations, surveying rough ground, sloping banks, ditches and grading roads. Plastic, pocket size.



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NEW CONTROL VALVES — *Item 9*

A new line of high capacity automatic control valves has been developed by the Controlled Flow Valve Company. The Controlled Flow valve was primarily designed for the safety and relief valve field but it can be adapted for almost all liquid and vapor control services by changing only external actuating equipment.

The Controlled Flow valve can be opened and closed manually and automatically either at the valve or at a remote location. The valve can be pneumatically, hydraulically or electrically operated from a remote location. It is easily adjusted and tested. The external actuating equipment can be removed for calibration and repair or can be replaced without removing the basic valve.

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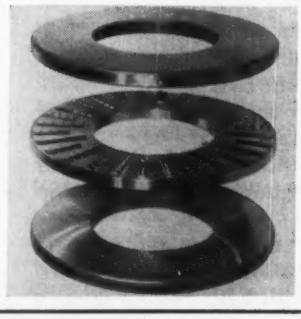
NEW BEARINGS — *Item 10*

New modifications in a high-capacity thrust bearing (T-59) for heavy duty applications on extruders, generators and pulverizers by Rollway Bearing Company, Inc., subsidiary of Lipe-Rollway Corporation, raise the new bearing's load capacity by approximately 9% and its life by about 29%. Increases are said to be due to a different type of retainer design that sets long roller slots of five rollers each in alternate positions with short roller slots of four rollers each. Thus, the new bearing will carry a 590,000 pound load at 100 RPM.



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Report to the Society Membership by NSPE's Representatives Delegated to Meet With Engineers Joint Council Representatives to Discuss Affiliation of NSPE With EJC

INTRODUCTION

The Unity Committee's report to the NSPE Board at Daytona Beach on June 20, 1953, contained the following comment and recommendation:

"The Committee recognizes . . . that before any recommendation could be made with respect to NSPE affiliation with EJC, certain fundamental questions must be resolved, such as:

(a) to what extent would present NSPE programs of public relations, registration, legislation and governmental liaison, etc., come into conflict with over-all EJC programs and policies?

(b) what would be the financial expense upon NSPE for EJC affiliation?

(c) will individual membership ultimately be a part of the expanded EJC organization?

(d) what would be the requirements for such individual membership in the expanded EJC?

(e) etc.

The Committee recommends continued study of the whole unity problem, and calls attention to the desirability of resolving this matter promptly in view of the expiration date of December 31, 1953, of the EJC invitation to join that group.

The Committee further recommends that representatives of NSPE be named to discuss this matter further with EJC in an attempt to resolve questions as outlined above, and that NSPE request a meeting with EJC for that purpose."

Action 53-78 of the NSPE Board at Daytona Beach on June 20 directed that a committee of NSPE members be named, and that NSPE request a meeting with EJC to discuss the matter of affiliation with EJC and seek answers to questions which have been suggested in connection with the invitation to join EJC.

Subsequent to the above Action, NSPE President T. Carr Forrest, Jr., appointed Messrs. J. D. Coleman, W. F. Ryan and C. T. Shoch as NSPE representatives and on June 25, 1953, requested similar action by Mr. R. J. S. Pigott, President, Engineers Joint Council. President Pigott announced his appointments by letter dated August 7 as follows:

Thorndike Saville, Vice President, EJC; Dean of Engineering, N.Y.U.

Dr. H. S. Osborne, Chairman, EJC Committee on Constitution and By-Laws; Chairman, Exploratory Group (retired Chief Engineer, A.T.&T. Co.).

Dr. L. W. Bass, Vice President, U. S. Industrial Chemicals, Inc.

A short time after the above announcement, it was found that Dr. Bass could not serve; and on September 2, President Pigott substituted Mr. E. J. Kates, Consulting Engineer.

The following suggested Agenda had been previously submitted to the EJC representatives for their consideration and development of answers.

SUGGESTED AGENDA FOR EJC DISCUSSIONS

I. Contemplated EJC activities and their relationship to similar activities of member and non-member groups.
   A. Possible designation of specific functions to individual societies or groups:
      1. American Society for Engineering Education
      2. Engineers Council for Professional Development
      3. National Council of State Boards of Engineering Examiners
      4. National Society of Professional Engineers
II. Relationship of NSPE programs to those of EJC
III. Financing of EJC
   A. Cost to NSPE
IV. Probability of individual membership in EJC
   A. If so, qualifications and grades
V. Qualifications for eligibility of organizations for membership in EJC
VI. Affiliation of state and regional organizations and engineers' clubs with EJC
VII. Implementation of EJC programs at local and state levels
VIII. Extent of EJC authority for direct action

In addition to the above proposed Agenda, the NSPE representatives were to attempt to get answers to the following:

QUESTIONS WHIGH MIGHT BE POSED IN EJC DISCUSSIONS

1. What is the contemplated EJC Budget for 1954? 1956? 1960? How is it to be raised? What staff is anticipated?
2. What will be the relation of EJC to NSPE's current programs?
   A. Government Liaison
   B. Public Relations
   C. National Defense
   D. Young Engineers
   E. Employment Practices
   F. Surveys
   G. Ethical Practices
   H. Interprofessional Relations
3. Is provision to be made for individual membership in EJC? If so, what qualifications?
4. To be eligible for membership in EJC, a society now must have engineers constituting at least 50% of its membership. How is this qualification evaluated?
5. If a member society disagrees with the EJC policy on a specific item, should it withdraw from membership if it wishes to pursue a contrary course?
6. Is it intended to affiliate local, state, and regional engineering societies and engineering clubs with EJC? If so, who will be eligible? What qualifications?
7. What procedures for local and state or regional implementation of programs are contemplated?
8. How will support of individual engineers be enlisted? Is an EJC publication contemplated?

THE MEETING

Immediately after completion of the EJC committee, an attempt was made to find a common date on which the six men concerned would be free to meet to discuss the questions raised incident to affiliation. It was not until September 18 that the commonly

agreeable date of October 12 was decided upon for the meeting.

The meeting took place at the Harvard Club, 27 West 44th Street, New York City, beginning at 10:00 A.M. on October 12 with all of the delegates present, including, also, Mr. T. A. Marshall, Jr., Secretary of EJC, who acted as recorder for the purpose of preparing a draft of the minutes of the meeting.

PRELIMINARY NOTES

In this section, and in the one to follow on "ANSWERS TO NSPE'S QUESTIONS," this report gives verbatim quotes from correspondence subsequent to the meeting. The source of these quotes is identified in each instance—using MARSHALL to indicate comments taken from the EJC draft of minutes dated October 14, 1953, COLEMAN from comments dated October 16, 1953, and RYAN from comments dated October 21, 1953. To avoid unnecessary duplication, the comments attributed to SHOCH are generally an added recollection or later thought.

MARSHALL

"There was a general exploratory discussion in which the representatives of EJC expressed the opinion that it was the earnest desire of Engineers Joint Council to form a unity organization for the ultimate benefit of the engineering profession. The Exploratory Group had considered this matter over a long period of time in extended discussions and had come to general agreement that it would necessarily take at least two steps. The first step would be the enlargement of Engineers Joint Council and the second step would be its development into the ultimate desirable unity organization with the help of all of its members, new and old."

ANSWERS TO NSPE'S QUESTIONS

I. Contemplated EJC activities and their relationship to similar activities of member and nonmember groups.

MARSHALL

"... the *ad hoc* committee examined the information on the standing committees of EJC as included in the Annual Report for 1952. Examples of the probable actions of EJC with respect to the designation or referral of specific functions to individual societies or groups such as ASEE, ECPD, NSPE, NCSBEE, based upon past actions of EJC, were brought out by the EJC members."

COLEMAN

". . . the answers were quite vague and the only item specifically mentioned as probably being referred to NSPE would revolve around the question of registration in the states."

RYAN

"It is obvious that this problem has not been thought through. The committee members, however, expressed the conviction that all items in the particular province of any society would be referred to that society. They said, as a special example, problems affecting registration would be promptly referred to NSPE. It was pointed out by the writer that they had failed to take up the problem of ethics with ECPD when it was raised at the UPADI organization. This failure, however, is, in the writer's opinion, due to the impetuous action of an individual member. Such 'impetuous' actions may be a problem for some time to come in the actual conduct of EJC affairs."

SHOCH

There was no indication that EJC would discontinue the exercise of initiative in its own behalf as and when opportunities arose for the development and promotion of programs, even though such programs might be in the field now covered by NSPE.

II. Relationship of NSPE's programs to those of EJC.

MARSHALL

". . . the possible conflict of activities in such areas such as might occur in the activities of the EJC Labor Legislation Panel were discussed. It was agreed that membership of NSPE in EJC should result in an even closer practical working arrangement where necessary or desirable in such areas rather than an increase in conflict."

COLEMAN

". . . it was indicated by Dr. Osborne that quite obviously there could be no control over the activities of the constituent societies, and therefore, they would be free to continue present programs or to initiate any that they saw fit. It was hoped that there would be a coordination of such programs as salary surveys, etc. in order to eliminate duplication of effort. There was no attempt to rationalize the other specific NSPE programs although there was considerable discussion of the Labor Panel and the 'freedom of association' principle as a case where joint efforts could be pursued without sacrifice of position."

RYAN

"It was obvious that if we do not join EJC there will be a considerable overlapping and, at times, competition. The gentlemen present at the meeting obviously felt that much of this overlapping could be eliminated if we were members of EJC."

SHOCH

There is no evidence that EJC would discontinue what it was doing in favor of NSPE, or would assign to NSPE the types of activities in which NSPE considers itself particularly effective.

III. Financing of EJC.

MARSHALL

". . . it was pointed out that on the basis of an NSPE dues income of $300,000, the NSPE share of financing EJC would be about 12%. It was further brought out that the budget for 1954, although not yet prepared, might be about $32,000 to $35,000 and that, when and if, the activities of the Engineering Manpower Commission were discontinued the EJC budget would be increased by probably $15,000 to $18,000 additional.

"For the information of the NSPE members present, it was pointed out that the Engineering Manpower Commission was financed solely through funds raised from industry."

COLEMAN

"Prior to the question of the probable cost of NSPE at the present time, Mr. Marshall reported that the budget for 1953 was $20,000 and there were no contemplated staff increases for 1954. He further indicated that there had been no budget committee appointed; however, it would seem desirable to have one in the near future. He estimated that the budget for 1954 would be approximately $32,000 and indicated that only a part of his salary was paid out of the EJC funds, the remainder coming from the Manpower Commission. He indicated that, on the basis of the $2,300,000 income of the present affiliated societies, a $30,000 budget for EJC for 1954 and NSPE income of $300,000 for 1954, our portion of the cost would be approximately $4,000. However, it was indicated that when the Manpower Committee funds run out the budget would have to be increased by at least $15,000."

RYAN

"It would appear that on the basis of last year's budget, membership in EJC would have cost us less than $4,000. The required contribution, however, will grow with expanded activities of EJC and with increasing dues income of NSPE."

SHOCH

NSPE's annual expense, if $6,000, would amount to about twenty cents ($0.20) per year per member, or 2% of dues income.

IV. Probability of individual membership in EJC.

MARSHALL

"In discussing the probabilities of individual membership in EJC and the affiliation of state and regional organizations and engineers' clubs with EJC, it was pointed out that a special committee to explore these areas had been formed recently and that at the present time, there was no means of determining just how this would develop. In any event, it was clearly brought out that individual memberships are not probable in the immediate future, that EJC must become a better organization before that can be considered."

COLEMAN

". . . Mr. Kates, who is a member of the special subcommittee of EJC reported that the special committee was due to report at the Executive Committee meeting on October 16. I received the impression, however, that the committee has not found any solution to the problem as yet. Dean Thorndike Saville said that competition for individual members at this time would not be desirable and that he was personally opposed. Mr. Osborne indicated that there was a strong feeling dating back even into the Exploratory Committee that individual membership should be eventually incorporated in EJC. He also mentioned that the exploratory group had considered that the NSPE local chapters could possibly become the individual membership organizations."

RYAN

"While it appears that EJC may ask the individual members of the constituent societies to contribute some money as individual dues, they have no intention of having a voting membership. Any money raised by individual contributions will be used for publications and the like that can be returned to the individual members, but beyond the opportunity to pay dues and receive certain publications either directly or through their societies, there is no prospect for individual membership. With this in mind, there is obviously no prospect of raising the minimum qualifications for individual members."

SHOCH

No additional comment.

V. Qualifications for eligibility of organizations for membership in EJC.

COLEMAN

"In answer to the question of evaluation of qualifications of engineer members of constituent or potential affiliating societies, we were referred to the EJC Constitution which indicates that they must be graduates of accredited schools or licensed in one of the states or territories. There was no discussion of the matter of requirements for maintaining the 50% ratio after affiliation."

RYAN

"The present Constitution of EJC states that a society to be eligible for membership must be national in scope and have a membership of more than 5,000 of whom at least 50% are 'Engineers.' Engineers are described as people who have an engineering degree from an accredited curriculum or who are registered as Professional Engineers. The American Society of Refrigerating Engineers has been rejected on the ground that less than 50% of the membership qualify under this liberal definition of 'Engineer.' American Water Works Association has been accepted and the American Society of Heating and Ventilating Engineers will be accepted on the basis of an agreement in regard to what their actual dues income is. In regard to the direct question as to whether AWWA met the constitutional qualifications, the answer was yes. The writer would doubt that AWWA or ASHVEE would meet this standard, but presumably EJC has relied on information from these societies."

SHOCH

No additional comment.

VI. Affiliation of state and regional organizations and engineer groups with EJC.

MARSHALL

"It was quite clearly brought out also that EJC did not contemplate setting up local groups of its own in competition with those that existed but that it was studying the problems of affiliation of existing state and regional organizations."

COLEMAN

"In regard to the question of the affiliation of local and regional groups, he (Mr. Osborne) reported that a committee has been studying this question and that a questionnaire was to be sent out to all such groups. This would be purely exploratory and there is no consideration at the present time as to how local and regional groups could be incorporated in the Council but it seemed likely that they would probably only be affiliated with no representation on the Council.

"Dean Saville said that it has never been proposed or considered that EJC should set up local groups. All of the EJC representatives agreed to this."

RYAN

"So far this program is merely in the exploratory state. A committee has been appointed which is considering addressing a questionnaire to all of the state, regional and local organizations. No membership in EJC is contemplated and the basis of affiliation has not been defined. The thought appeared to be that these local organizations would cooperate with EJC in certain matters also not yet defined."

SHOCH

EJC's representatives were definitely in the dark on this one. It is unlikely that a satisfactory procedure can be worked out for local group affiliations without serious sacrifice in the over-all professional content.

VII. Implementation of EJC programs at local and state levels.

MARSHALL

". . . Mr. Coleman described the problems encountered by the Dayton Technical Societies Council in effecting the type of coordination that would be necessary at the local level. It was pointed out that much needed to be done to bring to the members of the constituent societies the value to the profession of the activities of EJC.

"The problems of referring activities to local groups for implementation were also discussed as was the competition that might arise between EJC and other technical societies for membership in the event of individual membership in EJC."

COLEMAN

"In response to the question proposed in Section 7 in regard to the use or employment of the local chapters of NSPE, Mr. Marshall indicated that they certainly would be used to implement at least in part the EJC programs in a similar manner to the chapters and sections of the technical society."

RYAN

"This has not been thought out. The gentlemen at the conference were certain that EJC would welcome such implementation through our state societies and local chapters, but could

not believe that EJC would be willing to make such implementation exclusively through us."

SHOCH

At this point the observation was made that the over-all situation with respect to affiliation was analagous to two business concerns, one of which (NSPE) had limited manufacturing facilities (small staff and volunteer work) but an exceptionally good system (state societies and local chapters) for finding out what the buyers (grass roots engineers) need and want and distributing the product to them, and the other (EJC) had, mostly, only a potential for large output of a good product. In business, a merger would usually be an economic gain to both.

VIII. Extent of EJC authority for direct action.

MARSHALL

"The cumbersomeness of referring all decisions to the constituent societies prior to action was also discussed and it was pretty generally agreed that in order to be successful there must eventually be developed some means for direct action on the part of EJC."

RYAN

"EJC has not constitutional authority for direct action, but as a historical matter it has actually done so in several instances."

SHOCH

No additional comment.

IX. Other items.

MARSHALL

"In answer to a question with respect to whether or not NSPE would be barred from membership in the event that it did not accept the invitation, the representatives of EJC clearly pointed out that such would not be the case; however, the initiative toward membership in such an event would next have to come from NSPE. This would be similar to the action taken recently in the case of ASRE, which was not extended an invitation to join EJC although it participated in the Exploratory Group and subsequently initiated a request to join EJC.

"The EJC representatives stated that it was the earnest desire of the members of EJC that NSPE join EJC during the formative stages and aid in the development of the ultimate unity organization."

COLEMAN

"Dean Saville indicated that in his opinion the NSPE was very definitely involved in the problem of recognition of sanitary engineers particularly through registration in the states. He agreed that this was also a matter in which ECPD could assist through accrediting of courses.

"Dean Saville also indicated that if NSPE comes into EJC it is evidence that they would also be included in any arrangement made with ECPD.

"In response to the direct question of what would eventuate providing the NSPE Board would turn down the present invitation, the answer was that it would not close the door to future action, but that any future action would have to start with NSPE.

"It was my impression that at least as far as the three EJC representatives were concerned, they all were genuinely interested in having NSPE join EJC and all admitted that there had been activity on the part of some individuals on both sides which had made for lack of harmony. It was also freely admitted that in the past there had been a great deal of unfortunate and undesirable action initiated by some of the secretaries. An EJC representative even questioned the right of staff members to represent their societies on the Council. Mr. Marshall, however, read the Constitution which indicated that such staff members are qualified. In response to the question in regard to the advisability of excluding paid employees from representation on the Council, the representatives agreed that this would be a good thing and Dean Saville suggested that Dr. Osborne take it under consideration since he was Chairman of the Constitution By-Laws Committee.

"It was agreed that if a member society of EJC disagreed with an EJC policy it not only could follow its own course, but they should not withdraw from the Council."

GENERAL DISCUSSION

MARSHALL

(Item E33 (part) of EJC Executive Committee meeting of October 16, 1953.)

"Mr. Kates stated that it was the feeling of the EJC members present that the questions raised by NSPE had been satisfactorily answered. He pointed out that EJC had no plans for establishing regional or local units but was now exploring the problem of affiliation of existing regional societies with EJC. The EJC members present expressed the opinion that many of the questions concerning the enlargement of EJC were still under study and that it would be advantageous for NSPE to join EJC now so that they may have a part in the formation of the ultimate organization."

COLEMAN

"If nothing of any more substantial nature should eventuate from the Conference it is my personal feeling that we have at least created a far more cordial atmosphere among these three members of the Council, and I believe that it is perfectly possible that our relationship, greatly improved, may be in terms of future cooperative enterprises.

"On the basis of the fundamentally unsound nature of the council form of organization which, if it is to accomplish anything with reasonable dispatch, must sacrifice democratic concepts, I cannot in good conscience recommend affiliation with EJC at this time. In doing this, I realize that NSPE may thereby miss the opportunity to guide and shape the development of an eventually compressed form of organization, but feel that it will require too much time, effort and money to ever realize this objective, particularly in view of the attitudes of some individuals and the hierarchy of some societies."

RYAN

"It is the writer's opinion that the questions raised at the joint meeting in New York on October 12 were answered about as well as they could be at the present time, but there is a wide area of uncertainty on most of the items discussed.

" . . . there is no unqualified 'Yes' or 'No' answer to this question. It is entirely a matter of considering the pros and cons of accepting EJC's invitation and making a recommendation on the relative weight of the positive and negative considerations.

"At least we obtained answers to all of our questions to the extent that anybody could answer them at the present time. Obviously, the group is feeling its way and does not know what it wants to do in some areas and does not know how to do the things they have accepted as desirable.

"I went to this meeting with the conviction that holding it was a polite gesture on our part and also on theirs, but that it was a rather futile gesture in view of the fact I assumed that EJC did not want us to accept the invitation and that we had no conceivable reason for doing so. I came away with this conviction shaken and after all this time for reflection, I cannot say yet that I have crystallized my thoughts and I am in a position to make an unqualified recommendation.

"During the meeting I became convinced that the four men with whom we conferred want NSPE as a member of EJC. I had not expected that. Moreover, I am reasonably certain that the feeling would not be shared

by every member (or all members) of the Council. This should not influence our decision too much. There is at least as much prejudice and ill-informed opinion among the members of our Board as there is among the members of the Council. I am willing to believe that a large majority of the Council share the belief expressed with such obvious sincerity by Osborne, Kates, Saville and Marshall that we would be an asset to EJC. While Marshall is only a staff employee of the Council, his views are apt to express a majority opinion and, in fact, such staff representatives are often more influential in shaping the policies of our engineering societies than many members of the governing boards. One obviously considers a sincere invitation in a different light from a merely formal one, and I now have a firm belief that the invitation is sincere.

"The other event that completely astounded me was the unequivocal statement that EJC plans no 'grass roots' organization. This is hard to reconcile with the reports of the Exploratory Committee, or with the survey of local and regional organizations which we heard being vaguely planned at the meeting of EJC, which John and I attended as observers. However, there was no doubt as to the certainty on this point with respect to the four men to whom we were talking.

"This opens up a new vista. Can we effect a unity organization in which the technical societies have overwhelming control at the national level, leaving the 'grass roots' to us? Again, we should not be swayed by our prejudices. The thought of a unity organization in which we are united with the technical societies at the national level, but with professional activities reaching the individual through our state societies and local chapters, is attractive to me. If we join EJC, that will eventuate almost inevitably. There is no other way to reach the individual or to effect the program at state level. In a few large industrial centers, other local groups might cooperate through affiliation which is quite different from cooperation through active membership.

"Our joining EJC *could* result through force of circumstances in the practical equivalent of the so-called General Electric Engineers' Association unity plan. The professional societies would not dominate decisions on professional matters at the national level, as proposed by the General Electric engineers, but on the other hand, individual membership would be strictly professional, whereas the General Electric plan contemplates some dilution.

"On the other side of the picture, I still feel that EJC is set up on a cumbersome and ineffectual basis. Every society that joins it is a new source of weakness, making the ratification of its programs more difficult and time-consuming. If NSPE should join, it would add strength on the individual, local, and state levels, but might frequently add a divergent point of view to the deliberations of the council itself. Because of the structure of our organization, we believe it is important that the viewpoints of individual members should come easily to the top and that in the council-type organization it is difficult for this to occur. We believe further that our presence on the Council probably would bring in more of these individual or membership viewpoints and make the deliberations of the Council more time-consuming.

"Also on the other side of the picture, we have the probable active opposition by certain individuals in the Council to our proper function on the state and local levels. I can see certain members of the Council becoming extremely active on other forms of local organization, just as a matter of embarrassing our efforts. Here again, we should not let our preconceptions sway us. These individuals will not live forever, and the open-minded members of the Council will never learn the truth about us, unless we sit down with them and show them by example, as well as precept.

"I have said our membership would strengthen EJC. Whether we could strengthen it enough to make it effective or whether we would merely prolong an inept and floundering career, nobody could tell. If men were angels, such a union would accomplish everything we hope for the profession, but men are men, and we are doomed to a certain amount of ineptitude and floundering in trying to make a profession of engineering. We face a long hard battle to achieve our goals in any manner, but we may get farther faster by cooperation than by competition.

"As for competition, I know that the whole EJC program has been a serious handicap to us. There are thousands of professional-minded engineers who feel that EJC offers a solution to the unity problem and that our activities are superfluous. If it should eventuate that EJC's effectiveness as a unity organization is dependent on our state and local groups, it might materially change this picture.

"From the competitive point of view we are outnumbered and outdollared by EJC. They can extract money from industry in ways that we cannot and should not if we could. The Manpower Commission is a case in point. I visualize membership in EJC as an opportunity to give our members the benefit of EJC's power without accepting into our own ranks the sub-professional and non-professional members of the other societies.

"If we join EJC, it was indicated that we might also be invited to join ECPD. They are now holding all additional memberships until EJC has been reorganized. Advantages of alliance with ECPD are more obvious than in the case of EJC. Our state and local organizations would afford ECPD its first opportunity to talk to anybody except its own members and committeemen. It would give us a wealth of material for promotion of professional attitudes in the ranks of our profession and in the schools.

"EJC, with or without our membership, is not the unity organization that we seek. With NSPE, it is more nearly so, and has vastly more chance of becoming what the profession needs. In fairness to our members and to the profession of engineering, I feel we should accept this invitation. There is no commitment to perpetuate the alliance if the attitudes of other members defeat our purpose of making it an instrument to strengthen our state and local groups. At the same time, we are providing a 'grass roots' organization for EJC.

"While in the above I have emphasized the points of advantage to ourselves and to the profession . . . I have no conviction that our acceptance of this invitation would result in an immediate and important improvement in the status of our profession, but I do feel that in the long run, the profession will benefit more from an alliance between NSPE and EJC than by a continuance of the present competitive situation with rising tides of prejudice and misunderstanding in both groups.

". . . the above thoughts . . . indicate that full consideration has been given to possible advantages to NSPE which would accrue from our acceptance and what is more important, we have given primary consideration to the possible advantages to the profession. If these advantages are outweighed by disadvantages, particularly to the profession as a whole, we must regretfully decline the invitation."

SHOCH

NSPE will do all right, either in or out of EJC!

If NSPE goes in, it would be "buying a pig in a poke." This is evident from the indecisive way EJC has proposed and developed projects thus far. However, were NSPE to join EJC, it is entirely possible that NSPE could quickly demonstrate its effectiveness and thereby promptly assume a posi-

tion of major influence in, and actually preserve, the so-called unity organization.

NSPE could, of course, attempt to make sure that EJC affiliation would not stifle its action-packed programs by qualifying its membership to include the types of activities it should be permitted to handle. Obviously, EJC would have to turn down such a conditional affiliation because it does not yet seem to have the clear understanding needed to differentiate between present members in making assignments that cut across technical provinces, and would not want to add another doubt in the situation.

If NSPE declines the invitation, it must do so with stated reasons that are adequate to a large segment that is looking askance at NSPE's expressed desire for unity.

Unquestionably, the fullest possible cooperation is needed among all engineering groups to achieve unity. The answer from our standpoint seems to revolve around the relative potential for good if we cooperate *within* EJC *vs.* cooperating with EJC on the *outside*.

Respectfully submitted,
J. D. COLEMAN, P.E.,
W. F. RYAN, P.E.,
C. T. SHOCH, P.E.

Letters

(*Continued from page* 3)

losing his life, he will find it.

As I don't need to tell you, he must see his work in perspective with his life as a whole and with that of the human race. Out of this perspective will come a proper partition of work, play, love and worship—the four things men live by. The proportions will differ for each man and at each period of his life. He himself must be the judge. He forges his own destiny. This is the American Way of Life. It is a precious heritage that we must guard by giving it our best. It is the way of free men under God. My very best to you."

GILBERT E. DOAN, P.E.,
Pittsburgh, Penna.

Our Authors

Mr. Hernandez . . .

Alberto Hernandez, president of the Puerto Rico Society of Professional Engineers and a national director of NSPE, was born June 6, 1903, in Mayaguez, P. R. He holds a B.S. in civil engineering from the University of Puerto Rico and an M.A. from Harvard.

He has taught in the University of Puerto Rico's College of Agricultural and Mechanical Arts and has done engineering work in various capacities with agencies of the Island Government. He is now chief of the Technical Section, Puerto Rican Field Office, Public Housing Administration.

Mr. Doan . . .

Leland I. Doan was born in North Bend, Neb., November 9, 1894. Moving to Ann Arbor in his youth, he received his education at Ann Arbor High School and the University of Michigan.

In 1917 he entered the employ of The Dow Chemical Company in Midland. He became assistant sales manager in 1922 and was advanced to general sales manager in 1929. He continued to head Dow's sales organization until his election to the presidency of the company in 1949. Meanwhile, he had become a director in 1935, a vice president in 1938, and secretary of the corporation in 1941.

He holds numerous offices among Dow subsidiary and associated companies and is a director of the Michigan Bell Telephone Co., the Armed Forces Chemical Association, and the Health Information Foundation. He is also a member of the Industries Advisory Committee of the Advertising Council. He is a regent of the University of Michigan and has been awarded an honorary doctor of engineering degree by Case Institute of Technology.

Briefs

(*Continued from page* 7)

President J. C. Warner of the Carnegie Institute of Technology, Pittsburgh, Pa., has announced the scheduling of a special nine-week course — "Program for Executives" — for March 8 through May 7, 1954. The course, said President Warner, is designed to help middle-management executives meet the broader and more complex requirements of senior level positions in their organizations, whether large or small.

Admission will be limited to a group of about twenty-five to thirty executives in order to provide opportunity for maximum personal participation. The program will consist of four major work areas: Business Policies, Human and Labor Relations, Financial and Other Quantitative Controls, and Business in the American Economy.

The course will be given under the auspices of the Graduate School of Industrial Administration.

* * *

R. F. Tomlinson, manager, Conveyor Department, The Oliver Corporation, A. B. Farquhar Division, York, Pa., was elected president of the Conveyor Equipment Manufacturers Association at the group's twentieth annual meeting held recently at the Greenbrier, White Sulphur Springs, W. Va. He succeeds Harry C. Davis, general manager, Kanawha Manufacturing Co., Charleston, W. Va.

At the same time Fred S. Wells, vice president of the Stephens-Adamson Manufacturing Company, was appointed chairman of an education committee established to handle industry cooperation with engineering schools.

Want to Be a Coupon Clipper? See Page 42

Patents

(*Continued from page* 31)

facts, where you have made the invention using the company's equipment, facilities or using anyone in the company employ. You may have asked Al who is a clever machinist to take ten minutes to turn out just one little part for the device. It doesn't amount to anything and Al is glad to do it because you're a friend of his, but after all Al is a company employee, and that is a company machine, and company time, and company steel out of which the part is made. Those things come up so frequently, and they raise so much hob in relationships, the law has to consider so many different things, and the answer is so difficult to arrive at, that most companies feel than an employment contract settles it all once and for all and gets it set up one way or the other.

Such a contract is not too bad actually, even though many engineers object. Edison wasn't a company employee and Edison never got very rich. But the inventor of ethyl gasoline was and he died a millionaire. So maybe the idea that everything you do belongs to the company you're working for is a better one in the long run. We all like to be rugged individualists and though we may be wonderful inventors, hardly any one of us who is a good inventor is also a good industrial man and a good salesman and an accountant and a purchasing agent and possesses all the other abilities which are necessary in order to make money on his invention but which are supplied by the company.—*End.*

Strictly Business

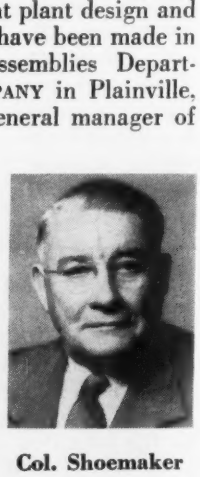
Operational Expansion . . . THE SHEFFIELD CORPORATION, Dayton, Ohio, will henceforth design, manufacture, and market Cavitron machine tools, according to a joint announcement by the CAVITRON CORPORATION, Long Island City, N. Y., and SHEFFIELD. In addition to Sheffield's exclusive distribution rights for the United States and Canada, both concerns will join in marketing the machines abroad. The agreement between the two corporations provides that Cavitron will continue to produce the ultrasonic transducers and generators and will issue licenses for the ultrasonic machining process through Sheffield.

HARLOW H. CURTICE, president of GENERAL MOTORS, has announced that the Corporation has acquired all of the outstanding stock of THE EUCLID ROAD MACHINERY COMPANY, Cleveland, Ohio. The Euclid Company will now be operated as a wholly-owned General Motors subsidiary, with the present management under RAYMOND Q. ARMINGTON, president and general manager, continuing in charge.

►

Personalities . . . A. F. DANTINO has been named production manager of the Industrial Rubber Products Plant of HEWITT-ROBINS, INC., in Buffalo, N. Y., it has been announced by FRANK BLANCHARD, factory manager; and HAROLD STOCKMAN has been named production superintendent, responsible to Mr. Dantino. . . . Also, at the HEWITT-ROBINS Buffalo plant, KENNETH L. WAY has become assistant manager of sales operations, and HARRY KNECHTEL has been named manager of hose sales and development. . . . GEORGE F. WIESE has been appointed mechanical engineer, Crusher and Process Machinery Division, NORDBERG MANUFACTURING COMPANY, Milwaukee, Wis., according to word from D. A. CHEYETTE, company vice president. He will also act as consultant to all company divisions on problems relating to cement plant design and operation. . . . Four new appointments have been made in the newly-established Distribution Assemblies Department of the GENERAL ELECTRIC COMPANY in Plainville, Conn., according to E. T. CARLSON, general manager of the department. The appointments are as follows: R. C. WILSON, manager of engineering; T. D. MACLAFFERTY, manager of marketing; CHARLES K. SKINNER, manager of manufacturing; and R. J. BLAIR, manager of finance.

Mr. Wiese



Col. Shoemaker

W. A. MACDONALD has been elected executive vice president, STERLING ENGINE COMPANY, Buffalo, N. Y., by the firm's board of directors; and CURTIS S. SMILEY, Rear Admiral, U.S.N. (ret.) has been appointed to the executive staff as assistant to the president, ROBERT RUSSELL. . . . O. Q. HINDS has joined the ULRICH PRODUCTS CORPORATION of Roanoke, Illinois, as general consultant. . . . COL. JOSEPH J. SHOEMAKER has joined THE HINCHMAN CORPORATION, Detroit engineers, as an associate and will assume the duties of manager of the Fire Protection and Safety Engineering Division, according to W. H. D. HINCHMAN, president of the firm. . . . The election of ALEXANDER F. LIST as vice president of the MAIN BELTING COMPANY, Philadelphia, manufacturer of stitched canvas conveyor belts, has been announced by H. PAUL GANT, chairman of the board. . . . ROBERT ALLEN, formerly of Dayton, O., is the new vice president for manufacturing with the SHURON OPTICAL COMPANY, Rochester, N. Y. . . . D. A. MILLIGAN has been named vice president in charge of sales of the AMERICAN TRACTOR CORPORATION, Churubusco, Ind., according to MARC B. ROJTMAN, president. . . . KENNETH E. KNOWLES has been elected a vice president of CLAPP & POLIAK, INC., New York industrial exposition management firm.

R. E. Allen, P.E.

STUART B. SMITH of Osprey, Fla., has been elected a director of THE VITRO MANUFACTURING COMPANY and of its subsidiary, VITRO CORPORATION OF AMERICA, according to an announcement by J. CARLTON WARD, JR., president. Mr. Smith is president of the HENRY PRATT CO. of Chicago, Ill. . . . The WESTINGHOUSE ELECTRIC CORPORATION has announced a number of recent personnel changes: HARRY W. TENNEY has been appointed administrative assistant to Vice President W. O. LIPPMAN of the Westinghouse Elevator Division in Jersey City, N. J.; ROBERT H. WAGNER has been named general application engineering manager of the same division.

►

Specialized Construction . . . Two newly-designed, standardized alert hangars for jet fighter interceptor aircraft, equipped with new-type doors that open in 30 seconds or less, have been fabricated for the U. S. AIR FORCE by the LURIA ENGINEERING COMPANY of New York and Bethlehem, Pa., and are now under construction at overseas bases—one in Iceland and the other in Tripoli. The hangars are being erected by joint-venture groups of American engineering and contracting firms. The project in Tripoli is being handled by CROW-STEERS-SHEPHERD, New York, with KNAPPEN-TIPPETTS, ABBETT-MCCARTHY ENGINEERING COMPANY, New York, as the architects and engineers. The project in Iceland is a joint venture by METCALFE-HAMILTON-SMITH-BECK, Norfolk, Va., with WYATT C. HENDRICKS as the architect.

►

Contract Awards . . . The ELIZABETH IRON WORKS of Elizabeth and Union, N. J,. has been awarded a contract by the NEW JERSEY HIGHWAY AUTHORITY to provide approximately ten miles of rails for bridges and over- and underpasses on the new Garden State Parkway between Woodbridge and Absecon, it has been announced by HARRY DIAMOND, president of the firm. . . . TURNER CONSTRUCTION COMPANY has been given the contract for the erection of the new WESTINGHOUSE ELECTRIC CORPORATION plant at Verona, Va., near Staunton. The architect is ROBERT & COMPANY of Atlanta, Georgia. . . . The ARMY CORPS OF ENGINEERS has awarded a contract for the joint-venture construction of a 610-mile, eight-inch military pipeline from Haines to Fairbanks, Alaska, to three firms: WILLIAMS BROTHERS COMPANY, Tulsa, Okla.; MCLOUGHLIN, INC., Great Falls, Mont.; and MARWELL CONSTRUCTION COMPANY, Vancouver, British Columbia.

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—Payroll Savers hold their Bonds: 75% of the $7,400,000,000 Series E Bonds which had matured up to June 30, 1953, were being retained by their owners beyond maturity under the automatic extension program.

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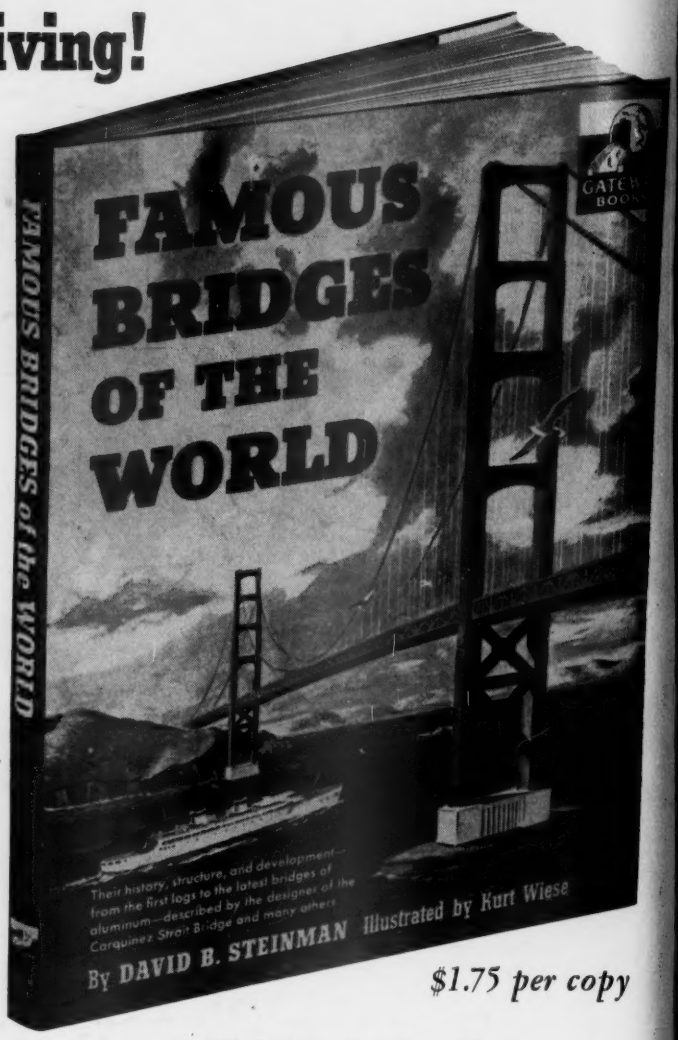
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